

Yorkshire Philosophical Society.

ANNUAL REPORT

FOR

MDCCCXCV.

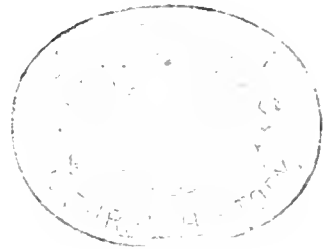
12 MAY 38

ANNUAL REPORT

OF THE COUNCIL

OF THE

YORKSHIRE



PHILOSOPHICAL SOCIETY

FOR

MDCCCXCV.

PRESENTED TO THE ANNUAL MEETING,

FEBRUARY 4th, 1896.

YORK:

H. MORLEY, PRINTER, PETERGATE, YORK.

1896.

TRUSTEES
OF
THE YORKSHIRE MUSEUM.
APPOINTED BY ROYAL GRANT.

TEMPEST ANDERSON, M.D.

EDWIN GRAY, LL.M.

WILLIAM LAWTON.

T. S. NOBLE.

REV. CHANCELLOR RAINE, D.C.L.

WILLIAM WALKER.

PATRONESSES

OF THE

Workshire **P**hilosophical **S**ociety.

HER MAJESTY THE QUEEN.

H. R. H. THE PRINCESS OF WALES.

PATRONS.

H. R. H. THE PRINCE OF WALES, K.G.

H. R. H. THE DUKE OF CONNAUGHT, K.G.

OFFICERS OF THE SOCIETY, 1896.

PRESIDENT:

SIR CHARLES STRICKLAND, F.G.S.

VICE-PRESIDENTS:

THE VERY REV. THE DEAN OF YORK.

THE REV CHANCELLOR RAINE, M.A., D.C.L.

JOHN FRANCIS WALKER, M.A., F.L.S., F.G.S., F.C.S.

F.Z.S., Fellow of Sidney Sussex College, Cambridge.

WILLIAM WALKER, F.G.S.

TEMPEST ANDERSON, M.D., B.Sc., &c., Fellow of University
College, London.

THE REV. W. C. HEY, M.A.

JAMES MELROSE, J.P.

MAJOR J. A. BARSTOW.

GEORGE S. GIBB, LL.B.

HENRY COWLING.

HON. TREASURER:

EDWIN GRAY, LL.B.

COUNCIL:

Elected 1894. J. E. CLARK.

C. E. ELMHIRST.

H. DENNIS TAYLOR.

R. THOMPSON.

Elected 1895. A. BUCKLE.

THE REV. A. S. COMMELINE.

G. C. DENNIS.

J. S. ROWNTREE.

Elected 1896. BOWDEN CATTLEY.

THE REV. CANON MACHELL.

G. MOSLEY.

H. J. WILKINSON.

HON. SECRETARY:

T. S. NOBLE.

CURATORS.

| | | |
|------------------------|--|---|
| GEOLOGY | - - - - - | J. F. WALKER, M.A., F.G.S. |
| MINERALOGY | - - - - - | W. H. HUDLESTON, M.A., F.R.S. |
| INSECTS AND CRUSTACEA | - - | G. C. DENNIS. |
| COMPARATIVE ANATOMY | - - - | T. ANDERSON, M.D., B.Sc. |
| ORNITHOLOGY | - - - - - | J. BACKHOUSE, F.Z.S., M.B.O.U. |
| ANTIQUARIAN DEPARTMENT | { REV. W. GREENWELL, D.C.L., F.R.S. REV. CHANCELLOR RAINE, D.C.L. | |
| BOTANY | - - - - - | H. J. WILKINSON. |
| CONCHOLOGY | - - - - - | REV. W. C. HEY, M.A. |
| OBSERVATORY | - - - - - | T. S. NOBLE. |
| METEOROLOGY | - - - - - | J. E. CLARK, B.A., B.Sc. |
| LABORATORY | - - - - - | J. F. WALKER, M.A., F.I.C., F.C.S., London and Berlin. |
| LIBRARY | - - - - - | A. BUCKLE, B.A. |

GARDEN COMMITTEE.

THE REV. CHANCELLOR RAINE, D.C.L.
MAJOR BARSTOW.
A. BUCKLE, B.A.
BOWDEN CATTLEY.
J. MELROSE, J.P.
THE LORD MAYOR [Mr Alderman Milward].

LECTURE COMMITTEE.

THE REV. CHANCELLOR RAINE, D.C.L.
TEMPEST ANDERSON, M.D.
MAJOR BARSTOW.
THE REV. E. S. CARTER, M.A.
G. S. GIBB, LL.B.
R. THOMPSON.

KEEPER OF THE MUSEUM.

HENRY MAURICE PLATNAUER, A.R.S.M., B.Sc.

REPORT OF THE COUNCIL
OF THE
YORKSHIRE PHILOSOPHICAL SOCIETY,
FEBRUARY 4TH, 1896.

The Council, in presenting their present report, are again able to congratulate the members on the prospects of the Society and of the various departments of science under the care of the respective curators. In a report of a Society recurring every year a considerable amount of sameness must always exist in the manner of its preparation; but each year brings with it new facts, and old members pass away and are succeeded by others. The various additions to the collections afford pleasing evidences of the kind interest continued to be taken in the welfare of the Society by our friends and members, which will be fully mentioned in the report. The report will follow the usual course. The finances of the Society will be first briefly referred to and the Treasurer's Balance Sheet appended to the report as audited will supply all particular information respecting income and outgoings.

The income of the Society from all sources amounts to £1,215 9s. 7d., and the total outgoings are £1165 9s. 5d., leaving a balance to the good of £50 0s. 2d., and this added to the balance in the Treasurer's hands at the close of last year of £107 8s. 5d., shows a balance to the good in the Treasurer's hands of £157 8s. 7d.

The Reed Fund, which, it will be remembered, consists of an investment of £600 in the York Corporation Stock, kindly bequeathed by our late Vice-President, William Reed, Esq., has by accumulated interest and from other sources, been augmented to a capital sum of £657 6s. 11d.

ABBEEY WALLS.—It will be recollected that in April last a part of the old wall between the grounds of St. Mary's Abbey and Bootham was temporarily exposed to view during

the rebuilding of some properties near to Bootham Bar. A good deal of interest was expressed by the public in the preservation of these remains, and on the suggestion of several of our members your Council issued an appeal for subscriptions, the responses to which enabled them to purchase a small area between the Abbey Wall and Bootham so as to permanently expose to view one half of the round tower near to Bootham Bar, and a short length of the adjoining wall.

At a later stage the co-operation of the City Authorities was secured and the Corporation agreed to contribute £200 towards the fund and to take over from the Philosophical Society the responsibility for the preservation and maintenance of the whole of the Abbey Wall. This allowed of the additional purchase of the house and shop adjacent to the beautiful angle tower at the corner of Marygate and Bootham.

It is greatly to be hoped that the commencement at these two points will result in future extensions of the open space along the line of this fine old wall as opportunities occur.

The subscriptions, exclusive of the £200 from the Corporation, have amounted to £672 9s 6d., of which sum only £6 13s. 6d., remains unpaid. When this latter amount is received the account will shew a small balance of £16 4s. 1d. in hand, to provide for some small expenses which are still outstanding.

The Council recommend “that the Hon. Secretary be “authorized to execute the Deed of Conveyance of the Abbey “Walls to the York Corporation, subject to the conditions and “on the terms approved by the Council of the Society and “accepted on behalf of the Corporation.”

ANTIQUITIES.—In the Department of Antiquities the past year has been a most successful one. In every sub-division of it, numerous additions have been made. The Roman Collection has been considerably added to. For the case of Mediæval Pottery many specimens have been acquired, which have necessitated the re-arrangement of the whole collection which is now far superior in extent and importance to that preserved in any Museum in the country. We have also secured by purchase two fine cup and ring marked stones discovered in the neighbourhood of Robin Hood’s Bay, and in the course of

the year many remarkable specimens of mediæval carving, both in stone and wood, have found a home in the Museum.

An attempt has also been made to fill up in a more systematic way the many vacant places in the Collection of Coins and Medals. In this work the Subscribers and the Inhabitants of York have it in their power to render very material assistance.

GEOLOGY.—The Honorary Curator of Geology reports that during the past year the specimens of foreign fossils have been placed in drawers so as to be available for comparison with the English specimens.

No large additions have been made to the Collection during the year, but the following donations have been presented.

A Skull of *Urus*, from Preston, Lancashire, presented by the Rev. E. M. Cole, and a fossil tooth of *Elephas antiquus* from the old Beach at Sewerby, by Miss Sleight.

Fossils have also been given by Capt. Barstow, R.N., W. Draper, M.D., Surgeon-Colonel Donaldson, and by the Honorary Curator.

MINERALOGY.—The Department has received but few additions during the past year, the chief being some Rhenish and Tyrolese rocks and minerals. The Society is to be congratulated on possessing a Mineral Collection which may be regarded as a good representative one, so far as species go. But in many cases better specimens, illustrative of species, would be welcome. The Rock Collection is fairly good, but there are great gaps in the Intermediate Lavas and Basic crystallized rocks.

COMPARATIVE ANATOMY.—The most notable addition made to this department during the course of the year is a Gnu, presented by Mr. C. J. Leyland. The carcase of the animal is at present being macerated, and if room can be found for it, it will, when mounted, form an interesting addition to the collection.

ENTOMOLOGY.—The collections in this department are in good order. The Rev. W. C. Hey continues to make additions to the collection of Coleoptera that bears the name of his family.

The Honorary Curator added to the Trichoptera some specimens of *Halesus guttatipennis* taken by himself. This capture is important, as the species has never before been found in the county, and only three times previously in the British Isles. The re-labelling of the Neuroptera on the same plan as that adopted in the Introductory series, referred to in the Report for 1893, is now in hand, and the Curator is in hopes that it may be completed before the end of 1896.

CONCHOLOGICAL DEPARTMENT.—Last year the Honorary Curator remarked on the need of a Cabinet for storing a good local collection of Land and Freshwater Shells. This need has been met by the presentation to the Society by Mrs. North of an excellent and capacious Cabinet. The Cabinet contains a large quantity of British Shells, which, after careful revision and selection, will form a useful collection. The Honorary Curator hopes that York Conchologists (of whom there are a considerable number) will endeavour to furnish this collection with specimens of any interesting local varieties they may meet with. The county is rich in varieties, and our Museum ought to contain a full collection.

ORNITHOLOGY.—Several Cases have been added during the past year to the British Bird Collection, including a fine Specimen of White's Thrush (*Turdus varius*) killed in Holderness, Greater Black backed Gull, Field Fare, Hooded Crow, Rock Dove and Tree Pipit from Bridlington, and a Dipper (*Cinclus aquaticus*), which lived for some weeks about Holgate Village and was frequently observable under the eaves of the Fox Inn. It eventually flew foul of the Telegraph Wires on the Borobridge Road.

Our Donations have consisted of an immature Red-throated Diver, from Cottingwith, and two Cases of Cinghalese Birds.

The labelling of the New Cases is now being proceeded with.

The British Birds' Eggs are now all carefully labelled both with name and locality, though no additions have been made.

BOTANY.—British Collection.—The following interesting specimens of Phanerogamous Plants have been added to the Herbarium.

Cardamine bulbifera R. Br. (Coral root) from Sussex (E. H. Farr, Esq.)

Raphanus maritimus Linn. (Shoreham) presented by T. Hilton, Esq., Brighton.

The Rev. Chancellor Raine has presented a small but interesting collection of plants gathered during the years 1826-1830, by Mr. W. Bain.

The work of cataloguing the specimens has progressed steadily, and the representatives of the N.O. Cruciferæ have been entered in the Herbarium Catalogue.

METEOROLOGY.—Three times over was the weather of 1895 the subject of unusual comment, on each occasion because of conditions unprecedented since your first weather report was presented in 1841. None will soon forget the nine weeks' frost, ending only in March, the magnificent weather with which September atoned for the disappointment of the usual summer, and the inrush of cold at the close of October, which was happily not a correct forecast of the ensuing months.

Temperature, as told by the maximum and minimum thermometers, was exactly the mean of the 50 years used in this Report for comparison, 1841-90, namely, 47·7° The table of Differences shows that this was largely due to the balancing of unusual divergencies, January, February, and October being unusually cold, September and November the reverse. The other months, except July, were also above the average.

The cold of the opening months is dealt with elsewhere (see Paper on the "Nine Weeks' Frost"). A maximum of 80° was touched on May 30th, but not again until September 2nd. Then came the following extraordinary series of readings, already referred to, at the end of the month.

| Date. | Max. | Min. |
|--------|------|------|
| 23 | 74 | 44 |
| 24 | 81 | 44 |
| 25 | 80 | 56 |
| 26 | 82 | 51 |
| 27 | 81 | 52 |
| 28 | 82 | 49 |
| 29 | 83 | 45 |
| 30 | 72 | 46 |
| Oct. 1 | 70 | .. |

Thus, whereas in 55 years the only records of 80° or over were 83° on September, 1868, and $80\frac{1}{2}^{\circ}$ on the 16th in 1890, yet in 1895 we have seven such records, six of them from the 24th on. The mean of the maxima 71.1° is 2.4° above the next highest, in 1865 ; 70° or more was recorded on 17 days. Then came a rapid change. Only 70° was reached on October 1st, after 83° on September 29th. Curiously the same reading has occurred thrice before in October, but never any higher, the years were 1848, 1861, 1869. The closing days were in striking contrast, the month from the 18th on being severe beyond precedent. The mean of the minima for the month (37.1°) is the lowest since 1842 (36.5°), but was approached in 1873 (37.3°), and 1880 (37.8°).

It may be noted that Sunshine was greatly in excess just as in September, but with the diverse result of clear days in winter compared to summer.

Mean pressure was near the average, being 29.898 inches, the range just exceeding two inches. Locally there were no really serious gales.

Bright sunshine was in excess in every month but March, November, and December. Over 200 hours were recorded in September, or nearly double the average. The totals in January and February are likewise greater than had been recorded previously.

Rain or snow, to an amount exceeding 0.005 inches of water, fell on 188 days, or 17 in excess of the average. Counting all occasions when even a few flakes fell, snow came on 45 days. There were 20 with thunder or thunderstorms. The total rainfall, 25.82 inches, was 0.81 in excess, although the general returns for the country show a deficiency.

The cumulative rain totals from 1841 for the three wettest months are again of interest from the closeness of the values. By a misprint in last year's Report the total for October was given 3 inches too small. October and July have now changed places, and the three months stand, August, 149.03 inches ; July, 148.26 ; October, 147.99 ; giving as means, 2.710, 2.696, 2.691 inches. Thus, after 55 years, the three wettest months are practically within an inch of each other, certainly a strange result. In like manner the three driest months,

reduced to 30 days, for comparison, give totals of 86·22 for March (actually 88·99), 87·66 for April, and 88·55 for February (actually 83·38). Here again the difference barely exceeds two inches. But there is the important contrast that the months are consecutive, with the least in the middle. The three highest falls are interrupted by September, with a total of 126·31 inches, which, even when corrected up to 31 days for comparison (130·52) falls some 18 inches behind them.

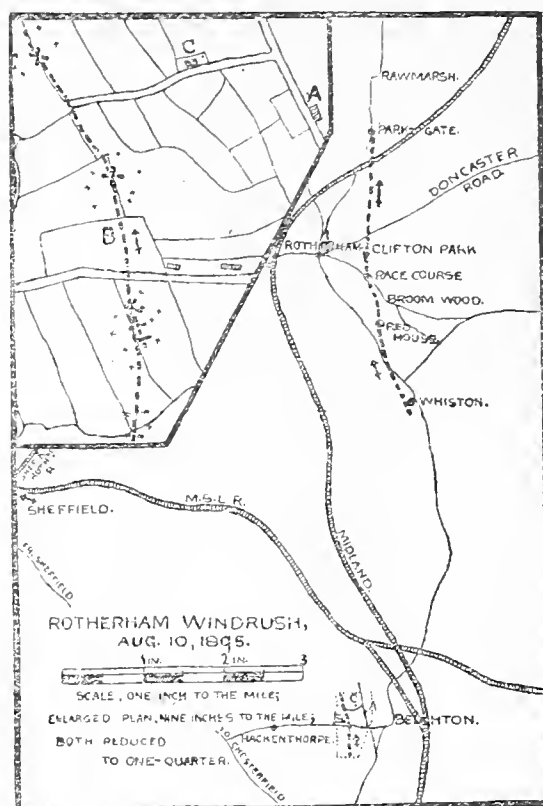
Floods of eight feet or over occurred on 14 occasions, the highest being that of July 27th, which reached 10 feet 10 inches, and did much damage to outstanding hay. A table is appended showing, so far as the meagre returns will permit, the comparative rise of the Ouse at York, and higher up the three main affluents. It will be observed that the time taken to reach us from the three upper guages is about 24 hours from Pateley Bridge on the Nidd, rather less from Middleham on the Ure, and apparently longer from Richmond on the Swale. There is sufficient relation between the heights at the Upper Stations and the consequent flood at York, to show how accurately the height of the latter might be foretold, had we a system of recording guages.

Auroras were noted on 23 nights, a considerable falling away from the total of 1894, and associated with the corresponding reduction in solar activity as indicated by sun spots. The most noteworthy were on March 13th and November 9th. The monthly distribution was 5, 2, 3, 1, from January to April, and 2, 2, 3, 5, from September to December. Their "values" on the scale of previous years were 28, against 44 last year and 28 in 1894.

Mock Suns were noted on March 17th, April 20th, May 30th, and September 8th.

A remarkable and destructive *Windrush*, or so-called Whirlwind, near Rotherham, should be recorded; details of it are given in the *Natural History Journal* for October. It occurred on August 10th, about 7-30 p m., during the progress of one of the violent thunderstorms which made last summer notable. Its course, nearly due North, was about eight miles long, and the serious damage on the outskirts of Rotherham suggest what might have occurred here on March 8th, 1890, had the track

near Bishopthorpe, Fulford, and Heslington been shifted one or two hundred yards so as to have struck those villages, or had it passed a mile or two further north over our own city. A



plan of the Rotherham storm-track, lent by the *Natural History Journal*, is appended.

We have pleasure in again acknowledging the returns from different gentlemen, entered under their names in our tables.

PHOTOGRAPHIC SECTION.—The number of members of this Section in 1895 has remained about the same as during the previous year, but it is expected that the next year will bring further recruits. The meetings have been regularly held, generally on the first Wednesday in each month, but no meetings were held during the summer months. The financial state of the section remains healthy, especially, as since its first inauguration which involved considerable outlay, the annual expenditure has generally been on a very modest scale. Those who are members of the Yorkshire Philosophical Society or belong to the families of such, or are associates of the same, cannot be too constantly reminded that, if they are at all practically interested in photography, they can become members of the Photographic Section by intimating their desire to join to the Hon. Secretary, Mr. H. Dennis Taylor, Trenfield, Holgate, either directly or through the medium of any member of the Section, and by paying the very moderate annual

subscription of 2s. 6d. The meetings of the Section afford ample opportunities for members interchanging experiences and giving hints upon the practical working of photographic processes, which are specially valuable to comparative novices, and also for discussion upon the newer processes, discoveries and instrumental aids in this fascinating art-science. The Section gave a public exhibition of lantern slides in April, which, as usual, seemed to be much appreciated, and the Section intends if possible to give at least one public exhibition of lantern slides in each winter.

The Society has lost by death during the past year eight members. The following may be specially mentioned:—Mr. Wm. Barnby, Mr. Joseph King, Mr. George Oldfield, Mr. W. F. Rawdon, and Mr. W. W. Wilberforce.

Mr. Wm. Barnby, a member of a well-known York family distinguished in musical circles, did good service on the Council of our Society and his loss leaves a vacancy which it will not be easy to fill up. It will be in the remembrance of all present that a younger brother of our late member of Council attained to the highest position in his profession and received the Honour of Knighthood. A few days ago he died in the prime of life, and on this very day his funeral service is being held in the Cathedral Church of the Metropolis.

Mr. Rawdon was the oldest member of the Society, having been a member continuously for more than fifty years.

Mr. Joseph King attained to a great age and had been for many years a member of our Society.

In Mr. George Oldfield the Society has lost a good friend and supporter. On more than one occasion he joined our Council and took an active interest in our affairs.

Mr. Wilberforce, who attained to the highest civic offices in his native city during the time he was a member of our Society, by his influence and support rendered to us good aid.

Three Lady Subscribers have died during the past year, and the Society has lost by resignation 27 Members, 3 Lady Subscribers and 3 Associates. On the other hand 35 new

Members, 9 Lady Subscribers and 3 Associates have joined the Society.

The Council recommend for election as new members of the Council, George Mosley, Esq., Bowden Cattley, Esq., H. J. Wilkinson, Esq., Rev. Canon Machell, in the room of The Lord Mayor (Mr. Alderman Milward), The Rev. E. S. Carter, Dr. Collins, and H. Copperthwaite, Esq., who retire by rotation.



NEW MEMBERS.—1895.

Adams, S. H., 71, *Micklegate*.
 Baines, W. M., *Bell Hall*.
 Brett, W. H., 11, *The Mount*.
 Burchell, Rev. Wm., *St. Mary's*.
 Byass, D., *St. Peter's Grove*.
 Day, C. H., *Lendal*.
 Empson, C., *Mill Mount*.
 Fairbank, F. Graham, *Lendal*.
 Faulkner, Chas. J., *Escrick*.
 Gwyn, Miss, *York County Hospital*.
 Halliwell, F. W., *North Eastern Hotel*.
 Howard, J. T., *Abbey View, Marygate*.
 Jesper, Thos. W., 19, *Micklegate*.
 King, Mrs., 20, *Burton Terrace*.
 Kirke, Colonel H., R.E., 29, *St. Mary's*.
 Kleiser, C. J., 22, *Parliament Street*.
 Linfoot, Mark, *Fossgate*.
 Lister-Kaye, Miss, 3, *St. Leonard's*.
 Lloyd, E. T., 26, *Grosvenor Terrace*.
 Long, D. Sanderson, 86, *Micklegate*.
 Lunley, Capt. the Hon. Osbert, A.D.C., 10, *St. Peter's Grove*.
 Mason, Mrs. E. Gertrude, *The White House, Clifton*.
 Middleton, J. V., *Feasegate*.
 Miller, Miss Clara A., *Crescent College*.
 Munby, Mrs., 36, *St. Mary's*.
 Robinson, C. E., 56, *Coney Street*.
 Rudgard, H. J., 20, *Bootham Terrace*.
 Rycroft, Capt. W., *Minster Yard*.
 Scott, Mrs., 28, *Blake Street*.
 Temple, Rev. Canon, *Clifton*.
 Thynne, Major General Reginald, *Government House*.
 Turner, Mrs., *St. Olave's Road*.
 Whitehead, Edwd., *Foss Bridge*.
 Wolfe, Mrs., 24, *St. Mary's*.
 Wood, Mrs., 26, *High Petergate*.

NEW LADY SUBSCRIBERS.

Brown, Mrs., 33, *St. John Street*.
 Coates, Miss C., 19, *Park Place*.

Lyth, Miss, 92, *Bishophthorpe Road*.
 Murgin, Mrs., 69, *Micklegate*.
 Newsom, Miss C., 8, *Grosvenor Terrace*.
 Rawlins, Mrs., *Queen Anne's Road*.
 Tateson, Miss, *The Yorkshire Club*.
 Umpleby, Miss, 19, *South Parade*.
 Wade, Mrs., *Monkgate*.

NEW ASSOCIATES.

Oglesby, H. N., L.R.C.P., *Tower Street*.
 Shaw, Rev. P. J., *St. Olave's Clergy House*.
 Thompson, H. F. D., *St. James' Terrace, Clifton*.

STATION, YORK.—THE MUSEUM.

Longitude 1° 5' W., Latitude 53° 57' N. Height above Mean Sea Level 51 feet.

| 1895. | Highest Barometer. | Lowest Barometer. | Mean Pressure at 32° Fahren- heit at M.S. Level | Air Temperature. | | | | | | | | | | Humidity. | | | | | | | | | | | |
|-----------|-----------------------------|-----------------------------|--|------------------|-------|-------|-------------|------------------------|-------|------|--------------------|--------|-----------------|--------------------|--------|--------|-------------|--------|--------|-------|------|------|------|------|------|
| | | | | Means of | | | | Absolute Min. and Max. | | | Depn. of Wet Bulb. | | | Tension of Vapour. | | | Percentage. | | | | | | | | |
| | | | | 9 a.m. | 9 p.m | Mean. | Min. & Max. | Min. | Date. | Max. | Date. | 9 a.m. | 9 p.m. | Mean. | 9 a.m. | 9 p.m. | Mean. | 9 a.m. | 9 p.m. | Mean. | | | | | |
| | | | | ° | ° | ° | ° | ° | | ° | | ° | ° | ° | in. | in. | in. | % | % | % | | | | | |
| January | 30th, 9 p.m. 30·664 | 14th, 6 p.m. 29·008 | ins. 29·717 | 31·1 | 31·1 | 31·1 | 31·2 | 26·3 | ° | ° | 11·2 | 11th | ° | 41·4 | 2nd | ° | 0·5 | 0·3 | 0·4 | ·162 | ·167 | ·165 | 92 | 95 | 94 |
| February | 16th, 6 p.m. 30·620 | 26th, 6 p.m. 29·662 | 30·134 | 28·7 | 29·8 | 29·3 | 30·1 | 23·8 | 36·4 | 2·7 | 8th | 46·0 | 28th | 0·6 | 0·6 | 0·6 | 0·6 | 0·6 | 0·6 | ·140 | ·149 | ·145 | 89 | 90 | 90 |
| March | 16th, 9 a.m. 30·325 | 28th, 6 p.m. 28·659 | 29·661 | 41·2 | 40·8 | 41·0 | 41·95 | 35·1 | 48·8 | 22·2 | 3rd | 60·6 | 22nd | 1·7 | 1·5 | 1·6 | 1·6 | 1·6 | 1·6 | ·223 | ·223 | ·223 | 87 | 88 | 88 |
| April | 14th, 9 a.m. 30·404 | 6th, 9 p.m. 29·171 | 29·888 | 47·2 | 46·6 | 46·9 | 47·45 | 39·3 | 55·6 | 29·0 | 8th & 15th | 63·0 | 21, 29, & 30 | 3·3 | 3·1 | 3·2 | 3·2 | 3·2 | 3·2 | ·249 | ·248 | ·249 | 77 | 79 | 78 |
| May | 4th, 8 a.m. 30·621 | 18th, 9 p.m. 29·619 | 30·111 | 55·2 | 51·4 | 53·3 | 53·7 | 43·3 | 64·1 | 33·0 | 5th | 80·3 | 30th | 4·6 | 2·8 | 3·7 | 3·7 | 3·7 | 3·7 | ·315 | ·309 | ·312 | 72 | 82 | 77 |
| June | 24th, 9 p.m. 30·475 | 29th, 9 p.m. 29·579 | 30·075 | 58·9 | 54·9 | 56·9 | 58·0 | 48·1 | 67·9 | 35·7 | 15th | 78·5 | 26th | 4·7 | 2·8 | 3·8 | 3·8 | 3·8 | 3·8 | ·360 | ·353 | ·357 | 72 | 82 | 77 |
| July | 6th, 8 a.m. 30·255 | 21st, 9 p.m. 29·400 | 29·819 | 60·0 | 58·0 | 59·0 | 59·95 | 52·1 | 67·6 | 45·0 | 5th & 13th | 79·3 | 8th | 3·8 | 2·2 | 3·0 | 3·0 | 3·0 | 3·0 | ·401 | ·415 | ·408 | 77 | 86 | 82 |
| August | 25th, 9 a.m. 30·235 | 4th, 9 a.m. 29·265 | 29·835 | 61·2 | 59·8 | 60·5 | 61·25 | 53·6 | 68·9 | 47·0 | 8th | 77·0 | 17, 18, & 21 | 3·8 | 3·0 | 3·4 | 3·4 | 3·4 | 3·4 | ·420 | ·420 | ·420 | 78 | 82 | 80 |
| September | 21st, 9 a.m. 30·419 | 11th, 8 a.m. 29·540 | 30·126 | 58·1 | 58·6 | 58·4 | 60·0 | 48·8 | 71·1 | 37·0 | 22nd | 83·0 | 29th | 2·7 | 2·6 | 2·7 | 2·7 | 2·7 | 2·7 | ·403 | ·413 | ·408 | 82 | 84 | 83 |
| October | 18th, 9 a.m. 30·579 | 3rd, 6 p.m. 29·022 | 29·812 | 43·7 | 43·3 | 43·5 | 45·3 | 37·1 | 52·5 | 24·4 | 29th | 70·0 | 1st | 1·8 | 1·5 | 1·7 | 1·7 | 1·7 | 1·7 | ·246 | ·248 | ·247 | 86 | 88 | 87 |
| November | 1st, 9 p.m. 30·549 | 12th, 9 a.m. 29·013 | ·849 | 44·4 | 45·0 | 44·7 | 45·2 | 39·7 | 50·7 | 32·0 | 19th | 62·0 | 16th | 1·3 | 1·5 | 1·4 | 1·4 | 1·4 | 1·4 | ·262 | ·264 | ·263 | 90 | 89 | 90 |
| December | 27th, 9 p.m. 30·465 | 12th, 6 p.m. 28·956 | ·748 | 38·3 | 39·1 | 38·7 | 38·8 | 34·1 | 43·4 | 27·0 | 22nd | 53·0 | 5th | 1·1 | 1·3 | 1·2 | 1·2 | 1·2 | 1·2 | ·209 | ·213 | ·211 | 91 | 89 | 90 |
| Year | Jan. 30th, 30·664 9 p.m. | Mar. 28th, 28·659 6 p.m. | 29·898 | 47·3 | 46·5 | 46·9 | 47·7 | 40·1 | 55·3 | 2·7 | Feb. 8th. | 83·0 | Sep. 29th | 2·5 | 1·9 | 2·2 | 2·2 | 2·2 | 2·2 | ·283 | ·285 | ·284 | 82·8 | 86·2 | 84·5 |

STATION, YORK.—THE MUSEUM.

Barometer 2 feet above ground. Thermometers 4 feet 3 inches above ground. Rain-gauge 1 foot 9 inches above ground (49 feet at rim above sea-level).

| 1895. | Amount of Cloud. | | | Rainfall. | | Sunshine Returns. | | | | Weather, No. of Days of | | | | | | | | Wind, No. of Observations of | | | | | | | | | | |
|-----------|------------------|--------|------|-----------|------|-------------------|-----------------------|----------------------|---------------------------|---------------------------------|--------------------|--------|------|------|--------------------|--------------|---------------|------------------------------|------------------|-----|------|----|------|-----|------|-----|------|------|
| | 9 a.m. | 9 p.m. | Mean | Total. | Max. | Day | Total hours. 1895. | Per-centage 1895. | Mean Hours 1881-90. | Mean Per-centage 1881-90. | Rain, Snow, &c. | Frosts | Snow | Hail | Thun-der Storms | Clear Sky | Over- cast | Gale | Visi- bility. | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | Calm |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| January | 6.1 | 5.2 | 5.7 | ins. | ins. | 19th | 265 | 27 | 25.6 | 10.6 | 23 | 28 | 21 | 0 | 0 | 5 | 8 | 0 | 2 | 32 | 1 | 15 | 3 | 1 | 2 | 4 | 4 | 0 |
| February | 5.6 | 5.1 | 5.4 | 0.33 | .10 | 24th | 99 | 37 | 53.1 | 19.5 | 10 | 28 | 14 | 0 | 0 | 5 | 6 | 0 | 1 | 22 | 10 | 9 | 2 | 2 | 1 | 3 | 7 | 0 |
| March | 6.5 | 6.6 | 6.6 | 2.06 | .40 | 19th | 85 | 23 | 98.6 | 26.9 | 19 | 19 | 4 | 0 | 1 | 4 | 12 | 1 | 9 | 10 | 0 | 6 | 5 | 10 | 4 | 20 | 6 | 1 |
| April | 5.8 | 6.2 | 6.0 | 1.47 | .58 | 25th | 152 | 36 | 128.0 | 30.6 | 11 | 10 | 1 | 0 | 0 | 2 | 6 | 0 | 8 | 8 | 9 | 7 | 2 | 11 | 5 | 14 | 4 | 0 |
| May | 4.1 | 3.9 | 4.0 | 0.45 | .22 | 1st | 211 | 43 | 187.1 | 37.8 | 7 | 1 | 0 | 0 | 2 | 11 | 4 | 2 | 13 | 16 | 2 | 14 | 6 | 7 | 1 | 10 | 6 | 0 |
| June | 5.1 | 4.7 | 4.9 | 3.12 | 1.26 | 1st | 194 | 38 | 168.6 | 33.5 | 14 | 1 | 0 | 0 | 5 | 5 | 4 | 0 | 12 | 14 | 4 | 6 | 3 | 6 | 5 | 14 | 8 | 0 |
| July | 6.5 | 7.0 | 6.8 | 3.84 | .97 | 18th | 167 | 33 | 161.5 | 32.1 | 19 | 0 | 0 | 0 | 5 | 0 | 12 | 0 | 0 | 5 | 1 | 4 | 2 | 16 | 6 | 22 | 6 | 0 |
| August | 6.4 | 5.3 | 5.9 | 2.08 | .49 | 10th | 148 | 33 | 147.7 | 32.5 | 19 | 0 | 0 | 0 | 5 | 1 | 4 | 0 | 7 | 0 | 0 | 0 | 5 | 19 | 12 | 22 | 3 | 1 |
| September | 3.7 | 2.8 | 3.3 | 0.88 | .42 | 6th | 201 | 54 | 105.4 | 28.1 | 7 | 0 | 0 | 0 | 1 | 10 | 1 | 0 | 6 | 2 | 0 | 8 | 8 | 18 | 6 | 12 | 3 | 3 |
| October | 4.8 | 5.0 | 4.9 | 3.49 | .83 | 3rd | 121 | 38 | 80.5 | 25.1 | 19 | 11 | 1 | 1 | 0 | 8 | 8 | 1 | 13 | 12 | 0 | 2 | 2 | 9 | 5 | 21 | 9 | 2 |
| November | 7.0 | 6.2 | 6.6 | 2.64 | .38 | 5th | 28 | 11 | 42.1 | 16.9 | 22 | 8 | 0 | 0 | 0 | 1 | 11 | 2 | 3 | 2 | 3 | 13 | 5 | 18 | 9 | 5 | 3 | 2 |
| December | 7.8 | 6.7 | 7.3 | 2.29 | .41 | 28th | 17 | 8 | 24.5 | 10.5 | 18 | 20 | 4 | 2 | 0 | 2 | 14 | 3 | 9 | 3 | 3 | 12 | 7 | 10 | 4 | 16 | 7 | 0 |
| Year | 5.8 | 5.4 | 5.6 | 25.82 | 1.26 | June 1st | 1488 | 31.8 | 1222.7 | 26.75 | 188 | 126 | 45 | 3 | 20 | 54 | 90 | 9 | 83 | 126 | 33 | 96 | 50 | 127 | 60 | 163 | 66 | 9 |

NOTE.—On September 9th, the Thermometers and Rain Gauge were removed to a new position in the Museum grounds, where the exposure is better. The height of these instruments above the sea level is now about 5 feet greater than it was.

RIVER HEIGHT RECORDS REGISTERED BY THE AUTOMATIC RECORDER
AT GUILDHALL, YORK, 1895.

| Date. | JANUARY. | | FEBRUARY. | | MARCH. | | APRIL. | | MAY. | | JUNE. | |
|-------|----------|-----------------------------|-----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|
| | Time. | Above or below S.L. ft. in. | Time. | Above or below S.L. ft. in. | Time. | Above or below S.L. ft. in. | Time. | Above or below S.L. ft. in. | Time. | Above or below S.L. ft. in. | Time. | Above or below S.L. ft. in. |
| 1 | m'dnight | 1 5 | noon. | 0 2 | m'dnight | 5 3 | 1 a.m. | 5 7 | m'dnight | below 2 6 | noon. | 0 6 |
| 2 | 1 a.m. | 1 5 | " | 0 3 | 8 a.m. | 5 11 | 1 a.m. | 2 3 | noon. | 2 6 | m'dnight | 0 9 |
| 3 | 2 a.m. | 0 11 | " | 0 3 | 1 a.m. | 3 4 | 1 a.m. | 0 10 | m'dnight | 2 10 | 7 p.m. | 1 5 |
| 4 | noon. | 0 9 | 1 a.m. | 0 3 | 1 a.m. | 1 0 | 2 p.m. | 0 9 | 6 a.m. | 2 10 | noon. | 1 4 |
| 5 | 6 p.m. | 1 0 | noon. | 0 3 | 1 a.m. | 1 1 | 1 a.m. | 0 4 | m'dnight | 2 6 | 1 a.m. | 1 2 |
| 6 | 2 a.m. | 1 1 | " | 0 1 | noon. | 0 9 | m'dnight | 2 0 | noon. | 3 1 | 1 a.m. | 0 11 |
| 7 | noon. | 0 10 | 1 a.m. | 0 1 | m'dnight | 1 11 | 7 a.m. | 3 7 | " | 2 10 | noon. | 0 8 |
| 8 | " | 0 9 | 6 p.m. | below 0 7 | 2 p.m. | 2 7 | 5 p.m. | 1 9 | " | 2 11 | " | 0 7 |
| 9 | " | 0 9 | 1 a.m. | 0 6 | 3 p.m. | 2 5 | m'dnight | 0 9 | 1 a.m. | 1 6 | " | 0 6 |
| 10 | 1 a.m. | 0 8 | 1 a.m. | 0 3 | 11 p.m. | 4 5 | noon. | 1 2 | 6 a.m. | 0 1 | " | 0 6 |
| 11 | 1 a.m. | 0 3 | noon. | 0 0 | 1 a.m. | 4 4 | 1 a.m. | 1 0 | m'dnight | S.L. | " | 0 7 |
| 12 | m'dnight | 0 4 | " | 0 3 | noon. | 3 2 | 1 a.m. | 0 8 | noon. | 0 8 | " | 0 7 |
| 13 | 6 p.m. | 0 6 | " | 0 4 | 1 a.m. | 2 5 | noon. | 0 6 | " | 0 8 | " | 0 7 |
| 14 | m'dnight | 1 1 | 2 p.m. | 0 7 | 4 p.m. | 2 2 | " | 0 6 | " | 0 6 | " | 0 7 |
| 15 | noon. | 1 10 | noon. | 0 6 | m'dnight | 5 6 | " | 0 4 | " | 0 6 | " | 0 7 |
| 16 | m'dnight | 3 0 | " | 0 6 | 4 p.m. | 8 5 | " | 0 3 | m'dnight | 0 8 | " | 0 7 |
| 17 | m'dnight | 5 4 | " | 0 6 | 3 a.m. | 8 1 | " | 0 2 | noon. | 1 4 | " | 0 7 |
| 18 | 4 a.m. | 5 6 | " | 0 6 | 1 a.m. | 5 4 | " | 0 2 | 6 p.m. | above 0 5 | " | 0 6 |
| 19 | 1 a.m. | 3 10 | " | 0 6 | m'dnight | 3 6 | " | S.L. | noon. | 0 5 | " | 0 6 |
| 20 | m'dnight | 6 5 | " | 0 2 | 2 p.m. | 4 9 | " | below 0 2 | " | 0 5 | " | 0 6 |
| 21 | noon. | 8 0 | " | 0 3 | 1 a.m. | 4 4 | m'dnight | 0 5 | " | 0 6 | " | 0 6 |
| 22 | 1 a.m. | 7 2 | 1 a.m. | 0 2 | 3 p.m. | 3 4 | noon. | 0 7 | m'dnight | 0 8 | " | 0 6 |
| 23 | 1 a.m. | 3 11 | 9 p.m. | above 0 11 | 1 a.m. | 2 6 | 11 p.m. | 0 9 | 6 a.m. | 0 9 | " | 0 6 |
| 24 | noon. | 2 2 | m'dnight | 1 9 | m'dnight | 8 6 | 1 a.m. | 0 8 | noon. | 0 5 | " | 0 6 |
| 25 | 3 p.m. | 3 5 | noon. | 2 2 | 5 p.m. | 10 7 | 1 a.m. | 1 0 | " | 0 3 | " | 0 6 |
| 26 | 3 p.m. | 2 0 | 1 a.m. | 2 2 | 1 a.m. | 10 2 | 6 p.m. | 3 6 | " | 0 4 | " | 0 6 |
| 27 | 1 a.m. | 1 0 | noon. | 1 1 | 1 a.m. | 5 2 | 1 a.m. | 3 5 | 6 p.m. | 0 6 | " | 0 7 |
| 28 | 10 a.m. | 1 0 | 1 a.m. | 1 3 | m'dnight | 3 9 | 6 a.m. | 1 10 | noon. | 0 6 | " | 0 6 |
| 29 | 1 a.m. | 0 8 | " | " | 3 a.m. | 3 11 | 1 a.m. | 0 11 | " | 0 6 | " | 0 5 |
| 30 | noon | 0 6 | " | " | 1 a.m. | 3 1 | m'dnight | below 1 8 | " | 0 6 | " | 0 5 |
| 31 | 1 a.m. | 0 5 | " | " | 6 p.m. | 3 10 | " | " | " | 0 6 | " | " |

RIVER HEIGHT RECORDS.—Continued.

| Date. | JULY. | | AUGUST. | | SEPTEMBER. | | OCTOBER. | | NOVEMBER. | | DECEMBER. | |
|-------|----------|--------------------------------|----------|--------------------------------|------------|--------------------------------|----------|--------------------------------|-----------|--------------------------------|-----------|--------------------------------|
| | Time. | Above or below S.L. ft. in. | Time. | Above or below S.L. ft. in. | Time. | Above or below S.L. ft. in. | Time. | Above or below S.L. ft. in. | Time. | Above or below S.L. ft. in. | Time. | Above or below S.L. ft. in. |
| 1 | noon. | 0 5 | 6 a.m. | 1 4 | 1 a.m. | 1 1 | 9 p.m. | 0 7 | noon. | 1 8 | 9 a.m. | 4 6 |
| 2 | m'dnight | 0 5 | 1 a.m. | 0 11 | " | 0 10 | noon. | 0 6 | 1 a.m. | 1 6 | 1 a.m. | 3 4 |
| 3 | " | 0 11 | noon. | 0 7 | noon. | 0 7 | 1 a.m. | 0 7 | noon. | 1 2 | 1 p.m. | 2 0 |
| 4 | noon. | 0 10 | m'dnight | 0 9 | " | 0 6 | m'dnight | 2 4 | " | 1 0 | 3 p.m. | 2 6 |
| 5 | 9 a.m. | 1 0 | 8 a.m. | 1 2 | 10 p.m. | 0 7 | 6 a.m. | 2 6 | " | 1 0 | m'dnight | 9 6 |
| 6 | 1 a.m. | 0 10 | noon. | 1 0 | " | 0 11 | 10 a.m. | 1 3 | m'dnight | 3 7 | 6 a.m. | 9 11 |
| 7 | noon. | 0 6 | 6 p.m. | 1 7 | m'dnight | 1 4 | noon. | 1 0 | 4 p.m. | 7 9 | 1 a.m. | 6 10 |
| 8 | " | 0 5 | noon. | 2 0 | 6 a.m. | 1 6 | " | 1 1 | 1 a.m. | 6 6 | 1 a.m. | 2 10 |
| 9 | " | 0 3 | 4 p.m. | 1 0 | 6 p.m. | 0 9 | 4 p.m. | 3 1 | " | 1 11 | m'dnight | 2 2 |
| 10 | " | 0 3 | 1 a.m. | 0 10 | " | 0 10 | 3 a.m. | 2 10 | m'dnight | 2 0 | 8 a.m. | 4 11 |
| 11 | " | 0 3 | m'dnight | 1 7 | m'dnight | 1 1 | 3 p.m. | 1 8 | 8 p.m. | 6 4 | 1 a.m. | 3 4 |
| 12 | " | 0 3 | 1 a.m. | 1 7 | 5 a.m. | 2 0 | 1 a.m. | 1 4 | 1 a.m. | 6 0 | noon. | 2 8 |
| 13 | m'dnight | 0 6 | m'dnight | 2 3 | 10 p.m. | 1 1 | noon. | 1 1 | 3 a.m. | 5 7 | " | 5 5 |
| 14 | noon. | 0 6 | " | 2 7 | 2 a.m. | 1 1 | " | 1 0 | 1 a.m. | 3 4 | 6 a.m. | 5 5 |
| 15 | " | 0 5 | 5 a.m. | 3 1 | 6 a.m. | 0 10 | m'dnight | 1 4 | 11 a.m. | 4 11 | m'dnight | 5 2 |
| 16 | " | 0 3 | 1 a.m. | 2 1 | 1 a.m. | 0 2 | 9 p.m. | 4 6 | m'dnight | 6 3 | 3 a.m. | 5 3 |
| 17 | " | 0 4 | 6 a.m. | 1 6 | 9 a.m. | 0 6 | 1 a.m. | 4 1 | 2 p.m. | 9 5 | 2 p.m. | 3 8 |
| 18 | " | 0 4 | 6 a.m. | 0 9 | noon. | 0 3 | noon. | 1 3 | 1 a.m. | 8 8 | 1 a.m. | 2 10 |
| 19 | 6 p.m. | 0 6 | 6 p.m. | 0 8 | 11 p.m. | 0 4 | 3 a.m. | 1 2 | " | 4 1 | 3 p.m. | 1 9 |
| 20 | 6 p.m. | 1 2 | 6 a.m. | 0 6 | noon. | 0 2 | 1 a.m. | 1 0 | 3 p.m. | 2 0 | 3 p.m. | 1 5 |
| 21 | 1 a.m. | 0 10 | m'dnight | 0 5 | " | 0 2 | noon. | 0 9 | 6 p.m. | 5 6 | 1 p.m. | 1 2 |
| 22 | m'dnight | 1 6 | noon. | 0 5 | " | 0 2 | 5 p.m. | 1 9 | 1 a.m. | 5 1 | noon. | 1 1 |
| 23 | noon. | 2 0 | " | 0 5 | m'dnight | 0 6 | 3 p.m. | 1 9 | m'dnight | 4 7 | 1 a.m. | 1 0 |
| 24 | 6 a.m. | 1 1 | " | 0 6 | noon. | 0 6 | m'dnight | 1 4 | 3 a.m. | 4 7 | noon. | 0 11 |
| 25 | m'dnight | 0 10 | 8 p.m. | 0 8 | " | 0 6 | 1 a.m. | 1 4 | 1 a.m. | 2 10 | 3 p.m. | 1 2 |
| 26 | " | 9 1 | noon. | 0 5 | " | 0 6 | noon. | 1 0 | 10 a.m. | 2 3 | noon. | 0 11 |
| 27 | " | 10 10 | m'dnight | 0 6 | " | 0 6 | " | 0 11 | noon. | 1 11 | 6 a.m. | 0 11 |
| 28 | 1 a.m. | 10 9 | " | 1 10 | " | 0 6 | 1 a.m. | 0 11 | 2 p.m. | 2 0 | noon. | 0 8 |
| 29 | " | 7 9 | 7 a.m. | 2 10 | " | 0 6 | 6 a.m. | 0 11 | noon. | 2 2 | m'dnight | 1 5 |
| 30 | " | 2 9 | m'dnight | 1 4 | " | 0 6 | m'dnight | 1 0 | m'dnight | 2 6 | m'dnight | 7 4 |
| 31 | " | 1 11 | 6 a.m. | 1 4 | " | 0 6 | m'dnight | 1 0 | 10 a.m. | 5 8 | 10 a.m. | 8 8 |

HOUSE FLOODS FROM RETURNS TO THE CITY SURVEYOR.
COMPARATIVE TABLE, 1895.

| Date. | | Nidd at Pateley Bridge. | | Ure at Middleham Bridge. | | Swale at Richmond. | | Date. | York, Guildhall Gauge. | | | | | |
|-------|----|-------------------------|---------|--------------------------|---------|--------------------|---------|--------------------|------------------------|----------|----------------|------------|------------|-----|
| | | Hour. | Height | Hour. | Height | Hour. | Height | | Maximum flood. | | Hours from :-- | | | |
| | | | | | | | | | Hour. | Height | Patel'y | Mid-dleham | Rich-mond. | |
| | | | ft. in. | | ft. in. | | ft. in. | | | | | | | |
| Jan. | 20 | | | 5 p.m. | 2 1 | | | Jan. | 21 | noon. | 8 0 | | 19 | |
| Mar. | 1 | | | 11 a.m. | 4 9 | | | Mar. | 3 | 8 a.m. | 5 11 | | 21 | |
| " | 15 | 3 p.m. | 5 0 | 4 p.m. | 5 0 | 6 p.m. | 3 6 | " | 16 | 4 p.m. | 8 5 | 25 | 24 | 22 |
| " | 16 | | | 6 a.m. | 5 4 | | | " | 17 | 3 a.m. | 8 1 | | 21 | |
| " | 24 | 9 a.m. | 3 0 | 6 a.m. | 9 0 | 8-30 a.m. | 5 0 | " | 24 | midnight | 8 6 | | | |
| " | 24 | 1 p.m. | 8 0 | 4 p.m. | 11 6 | | | " | 25 | 5 p.m. | 10 7 | 28 | 25 | |
| " | 25 | 9 a.m. | 1 6 | 6 a.m. | 4 6 | | | " | 26 | 1 a.m. | 10 2 | | | |
| Apr. | 6 | | | 2 p.m. | 6 1 | | | Apr. | 7 | 7 a.m. | 3 7 | | 17 | |
| " | 25 | | | 4-30 p.m. | 5 1 | | | " | 26 | 6 p.m. | 3 6 | | 25½ | |
| July | 25 | 8 p.m. | 6 0 | 4-30 p.m. | 5 1 | | | July | 26 | midnight | 9 1 | | | |
| " | 26 | 8 p.m. | 7 0 | noon. | 11 6 | 7-30 a.m. | 6 0 | " | 27 | midnight | 10 10 | 28 | 36 | 40½ |
| " | 27 | 8 a.m. | 3 6 | 6 a.m. | 6 0 | 4-45 p.m. | 1 6 | " | 28 | 1 a.m. | 10 9 | | | |
| Aug. | 14 | | | 3 p.m. | 4 1 | | | Aug. | 15 | 5 a.m. | 3 1 | | 14 | |
| " | 27 | | | noon. | 5 6 | | | " | 28 | 7 a.m. | 2 10 | | 19 | |
| Sep. | 11 | | | 1 p.m. | 4 0 | | | Sep. | 12 | 5 a.m. | 2 0 | | 18 | |
| Oct. | 4 | | | 6 a.m. | 5 6 | | | Oct. | 5 | 6 a.m. | 2 6 | | 24 | |
| " | 15 | | | 4 p.m. | 4 0 | | | " | 16 | 9 p.m. | 4 6 | | 29 | |
| Nov. | 6 | 11 p.m. | 4 6 | | | 9-30 p.m. | 5 0 | Nov. | 7 | 4 p.m. | 7 9 | 17 | | 18½ |
| " | 7 | 1 a.m. | 3 0 | | | | | " | 8 | 1 a.m. | 6 6 | | | |
| " | 11 | | | 6 a.m. | 5 6 | | | " | 11 | 8 p.m. | 6 4 | | 14 | |
| " | 12 | | | 4 p.m. | 5 11 | | | " | 12 | 1 a.m. | 6 0 | | | |
| " | 16 | 5-30 p.m. | 7 0 | 7-30 p.m. | 11 0 | | | " | 17 | 2 p.m. | 9 5 | 20½ | 18½ | |
| " | 17 | | | 8 a.m. | 4 0 | | | " | 18 | 1 a.m. | 8 8 | | | |
| " | 18 | | | 7 a.m. | 2 6 | | | " | 19 | 1 a.m. | 4 1 | | | |
| | | | | | | | | Average interval.. | | | 23¾ | 21⅔ | 27 | |
| | | | | | | | | Miles from York .. | | | 35 | 45 | 45 | |

ADDITIONAL RETURNS SUPPLIED BY R. THOMPSON, Esq.

| 1895. | RAINFALL, CHERRY HILL, YORK. | | | | CHERRY BANK ILKLEY. | BRIGHT SUNSHINE, THE HERMITAGE, OSWALDKIRK. | |
|-------|------------------------------|--------------------------------|---------|--|---------------------------|--|---|
| | | Greatest depth in 24 hours. | | Number of days on which .01 or more rain fell. | | Hours. | Percentage of actual to possible. |
| | Inches. | Inches. | Date. | | Inches. | | |
| Jan. | 3.24 | .62 | 19 | 23 | 3.17 | 50.80 | 21.07 |
| Feb. | .26 | .10 | 24 | 8 | .64 | 98.00 | 36.70 |
| Mar. | 2.01 | .39 | 9, 19 | 17 | 1.56 | 87.08 | 23.92 |
| April | 1.41 | .58 | 25 | 12 | 2.16 | 150.30 | 35.95 |
| May | .41 | .22 | 1 | 7 | .47 | 207.90 | 42.25 |
| June | 3.18 | 1.22 | 1 | 14 | 1.50 | 184.25 | 36.41 |
| July | 3.78 | .99 | 18 | 21 | 6.10 | 146.75 | 29.00 |
| Aug. | 2.26 | .49 | 10 | 21 | 3.04 | 136.53 | 30.00 |
| Sept. | .86 | .40 | 6 | 7 | 1.81 | 188.25 | 50.33 |
| Oct. | 3.49 | .80 | 8 | 19 | 4.49 | 110.70 | 34.59 |
| Nov. | 2.47 | .38 | 5 | 21 | 5.33 | 46.75 | 18.77 |
| Dec. | 2.27 | .49 | 28 | 18 | 3.33 | 26.50 | 11.93 |
| Total | 25.64 | 1.22 | June 1. | 188 | 33.60 | 1433.81 out of 4,414 h'rs 'possible' | 32.48 |

DIFFERENCES IN 1895 FROM MEANS.

Columns 1—6 for fifty years, 1841—90; Columns 7—10 for ten years.

| | Mean Barometer. | Thermometer. | | | Rain. | Rainy Days. | Mean Rel. Humidy. 1881-90. | Sunshine. (1881—1890). | | Visibility. 1883-1892. |
|--------------------------|---------------------|-----------------|-----------------|------------------|-------------------|----------------|-------------------------------------|---------------------------|------------------|---------------------------|
| | | Min. | Max. | Mean of both. | | | | Hours. | Per- centage. | |
| Jan. | + 0.04 | — 5.9 | — 5.5 | — 5.7 | + 1.43 | + 8½ | + 2½ | + 39½ | + 16½ | 0 |
| Feb. | + 0.21 | — 9.2 | — 6.9 | — 8.1 | — 1.19 | — 3 | + 1½ | + 46 | + 17½ | — 1 |
| Mar. | — 0.22 | + 1.0 | + 1.8 | + 1.4 | + 0.39 | + 5 | + 1½ | — 13½ | — 4 | + 3 |
| April | — 0.01 | + 1.3 | + 2.0 | + 1.6 | — 0.14 | — 2½ | — 3 | + 24 | + 5½ | + 0½ |
| May | + 0.16 | + 0.4 | + 4.5 | + 2.4 | — 1.36 | — 6 | 0 | + 24 | + 5 | + 6½ |
| June | + 0.12 | — 1.1 | + 1.9 | + 0.4 | + 0.88 | + 1½ | — 0½ | + 25½ | + 4½ | + 7 |
| July | — 0.10 | 0.0 | — 0.6 | — 0.3 | + 1.18 | + 5½ | + 3 | + 5½ | + 1 | |
| Aug. | — 0.07 | + 1.7 | + 1.6 | + 1.6 | — 0.61 | + 5 | — 1½ | + 0½ | + 0½ | + 2½ |
| Sept. | + 0.20 | + 1.0 | + 8.7 | + 4.9 | — 1.52 | — 6½ | — 3 | + 95½ | + 26 | + 0½ |
| Oct. | — 0.03 | — 4.7 | — 2.0 | — 2.7 | + 0.87 | + 2 | — 0½ | + 40½ | + 13 | + 9 |
| Nov. | — 0.02 | + 3.4 | + 3.9 | + 3.6 | + 0.55 | + 5½ | — 1 | — 14 | — 6 | + 2½ |
| Dec. | — 0.15 | + 1.1 | + 1.1 | + 1.1 | + 0.33 | + 3 | — 0½ | — 7½ | — 2½ | + 9 |
| Year Actual Value. | — 0.006 (29.898) | — 0.9 (40.1) | + 0.9 (55.3) | 0.0 (47.7) | + 0.81 (25.82) | + 17½ (188) | 0 (84.5) | + 265½ (1488) | + 5 (31.8) | + 40 (83) |

FOR THE YEAR ENDING 31ST DECEMBER, 1895.

[illegible]

Examined and found correct,
J. A. CUNNINGHAME.

| EXPENDITURE. | | Cr. |
|--|----------|-----------|
| | £. s. d. | £. s. d. |
| Crown Rent | | 1 0 0 |
| Corporation Rent | | 19 6 8 |
| <i>Rates and Taxes:</i> | | |
| Rates and Taxes, Parishes of St. Wilfrid and St. Olave | 30 6 4 | |
| Waterworks Co.'s Rate.... | 6 9 6 | |
| Gardeners' Licenses | 2 5 0 | |
| Receipt Book Stamping and Cheque Book | 1 13 2 | |
| | <hr/> | 40 14 0 |
| Insurance | | 7 5 0 |
| <i>Salaries and Wages:</i> | | |
| Mr. Platnauer | 150 0 0 | |
| Mr. Fielden | 60 0 0 | |
| Miss Baines | 39 0 0 | |
| Mr. Guy | 25 0 0 | |
| Attendants at Museum and Hospitium, viz: | | |
| Attendant at Mu- seum..... | 65 0 0 | |
| Female attendant at Museum.... | 25 3 6 | |
| Female attendant at Hospitium.. | 32 10 0 | |
| | <hr/> | 122 13 6 |
| Gardeners, including extra duty at gate | 88 8 6 | |
| | <hr/> | 485 2 0 |
| Yorkshire Insurance Company— Annuity..... | | 197 15 |
| <i>General Repairs, and Expenses.</i> | | |
| Museum and Hospitium: | | |
| Ordinary Repairs, Additions, and Expenses | 16 3 0 | |
| Painting, White- washing, and the like | 18 12 0 | |
| Cabinet Maker's and Joiner's Work | 12 6 7 | |
| New Hot Water Boiler..... | 70 18 10 | |
| | <hr/> | 118 0 5 |
| Gardens: | | |
| Repairs and Additions.... | 21 8 4 | |
| Estate: | | |
| Builder's and Joiner's Work | 9 10 6 | |
| Plumber's and Smith's Work | 8 9 1 | |
| Painting | 3 19 4 | |
| Flood Gauge .. | 2 7 6 | |
| Keys of Gates.. | 5 16 8 | |
| | <hr/> | 30 3 1 |
| | <hr/> | 169 11 10 |
| Library | | 29 7 2 |
| Lectures | | 38 4 5 |
| Printing and Stationery | | 8 1 6 |
| Printing Reports & postages thereof | | 20 19 9 |
| Printing Communications to Mem- bers and postages of same | | 1 17 0 |
| <i>Gas, Coal, and Coke:</i> | | |
| Museum | 25 3 9 | |
| Gardens | 7 4 4 | |
| Estate | 20 14 6 | |
| | <hr/> | 53 2 7 |
| Antiquities: Purchases and Repairs | | 38 16 1 |
| Ornithological Department | | 11 7 1 |
| Meteorological Department | | 15 12 0 |
| Preparing Photographs for Sale | | 1 4 11 |
| Catalogues | | 11 13 4 |
| Sundry Postages | | 6 19 11 |
| Military Bands | | 5 17 4 |
| Sundries, including Carriage of Parcels, and Firewood | | 1 11 7 |
| | <hr/> | £1165 9 5 |
| Excess of Income over Expenditure | | 50 0 2 |
| | <hr/> | £1215 9 7 |
| <hr/> | | |
| Balance in hands of the Treasurer 31st December, 1894. | | 107 8 5 |
| Excess of Income over Expenditure, 1895 | | 50 0 2 |
| | <hr/> | £157 8 7 |

EDWIN GRAY, Hon. Treasurer.

THE TREASURER'S ACCOUNT IN CONNECTION WITH
THE FUND FOUNDED BY THE LATE DR. REED FOR
SPECIFIC PURPOSES.

| Dr. | INCOME. | £ s. d. | EXPENDITURE. | Cr. | £ s. d. |
|-----|--|----------------|-----------------------------------|--------|----------------|
| | Interest on £600 York Corporation 3 per cent. Redeemable Stock, less Income Tax..... | 17 8 0 | Excess of Income over Expenditure | 17 8 0 | |
| | | <u>£17 8 0</u> | | | <u>£17 8 0</u> |

BALANCE SHEET.

| | | | |
|---|------------------|--|------------------|
| Amount of Fund on 31st December, 1895..... | 657 6 11 | Amount invested in York Corporation 3 per cent. Redeemable Stock | 600 0 0 |
| | | Balance in hands of the Tresurer on 31st Dec., 1894 | 39 18 11 |
| | | Excess of Income over Expenditure, 1895..... | 17 8 0 |
| | <u>£657 6 11</u> | | <u>£657 6 11</u> |

EDWIN GRAY, Hon. Treasurer.

DONATIONS TO THE MUSEUM AND LIBRARY.

LIBRARY.

| BOOKS PRESENTED. | DONORS. |
|---|------------------------------|
| The Journal of the Chemical Society of London, vols. lxvii. & lxviii., 1895, and abstracts. | The Society. |
| The Bulletin of the American Geographical Society, vol. xxvi., No. 4, parts 1 & 2, vol. xxvii., Nos. 1, 2, 3. | The Society. |
| The Report of the British Association for the Advancement of Science, Oxford, 1894. | The Association. |
| Memoirs and Proceedings of the Manchester Literary and Philosophical Society, 4th series, vol. viii., No. 3, vol. ix., Nos. 1, 2, 3, 4, 5, 6. | The Society. |
| The 14th Annual Report of the United States Geological Survey, parts 1 & 2, 1892-93, and the United States Geological and Geographical Survey of the Rocky Mountain Region, vol. ix. | The United States Survey. |
| The Annual Report of the Board of Regents of the Smithsonian Institution to July, 1893. Annual Reports of the Bureau of Ethnology, 1889-90, 1890-91. Chinook Texts, by Franz Boas. Archæological Investigations in the James and Potomac Valleys, by Gerard Fowke; and the Siouan Tribes of the East, by James Mooney. An Ancient Quarry in Indian Territory, by W. H. Holmes; and List of the Publications of the Bureau of Ethnology, with Index to Authors and Subjects, by F. W. Hodge. | Smithsonian Institution. |
| The Records of the Geological Survey of India, vol. xxvii., part 4, vol. xxviii., parts 1, 2, 3, 4. | The Indian Survey. |

- | | |
|--|---------------------------------------|
| Catalogue of Snakes (in the British Museum), vol. ii.; of Mycetozoa; of Fishes, 2nd edition, vol. i., and the Spiders of Burmah. | } The Trustees of the British Museum. |
| Transactions of the Zoological Society of London, vol. xiii., part 10, and Proceedings, part 4, 1894, parts 1 & 2, 1895. | } The Society. |
| The Proceedings of the Royal Institution of Great Britain, vol. xiv., part 2, No. 88. | } The Institution. |
| The Proceedings of the Geologists' Association, vol. xiv., parts 1, 4, 5. | } The Association. |
| Transactions of the Leicester Literary and Philosophical Society, vol. iii., parts 9, 10, 11, 12, vol. iv., parts 1 & 2. | } The Society. |
| The Journal of the Manchester Geographical Society, vol. ix., Nos. 10, 11, 12, vol. x., Nos. 4 to 12. | } The Society. |
| A Monograph of the British Jurassic Gasteropoda, part 1, Nos. 7 & 8, by W. H. Hudleston, M.A., F.R.S. | } The Author. |
| Transactions of the New York Academy of Sciences, vol. xiii., 1893-94. | } The Academy. |
| Transactions of the Natural History Society of Northumberland, Durham and Newcastle-on-Tyne, vol. xi., part 2. | } The Society. |
| Kongelige norske Videnskabers Selskabs Skrifter, 1892-93. | } The Society. |
| Publication der Norwegischen Commission der Europäischen Gradmessung; Astronomische Beobachtungen, Pendelbeobachtungen, 1895. | } The Society. |
| Nova acta der Kaisl. Carol. Deutschen Akademie der Naturforscher; Leopoldina, 1894. | } The Academy. |
| Boletin of the National Astronomical Observatory of Tacubaya. | } The Council. |
| Zwanzwiger Bericht der Oberhessischen Gesellschaft für Natur und Heilkunde für 1859, 62, 63, 67, 1873; 76, 77, 78, 79, 80, 81, 82, 83, 84, 86, 87, 89, 90, 92, 93, and 1895. | } The Society. |

- Annalen des K. K. Naturhistorischen Hofmuseums, 1894. } The Society.
- Bergen Museum Aarsberetning for 1893. The Council.
- The Proceedings of the Russian Naturalists' Society, vol. xxiii. } The Society.
- The Proceedings of the Russian Zoological vol. xiii., Nos. 1 & 2, vol. xiv., No. 1. } The Society.
- The Transactions of the Russian Geological Society, vol. viii., Nos. 2 & 3, vol. ix., Nos. 3 & 4, vol. x., No. 3, vol. xiv., Nos. 1 & 3, and Bulletin, vol. xii., Nos. 8 & 9, vol. xiii., Nos. 1 to 9, vol. xiv., Nos. 1 to 5. } The Society.
- Journal of the Transactions of the Victoria Institute, Nos. 77 to 101. } Captain Purey Cust.
- Records of the Geological Survey of New South Wales, vol. iv., parts 3 & 4. } The Survey.
- Transactions of the Burton-on-Trent Natural History and Archæological Society, vol. iii., part 1. } The Society.
- Transactions and Proceedings of the Perthshire Society of Natural Science, vol. ii., parts 2 & 3. } The Society.
- A Reprint from the Transactions of the Zoological Society of London on the Moas of New Zealand, by Prof. T. J. Parker. } The Author.
- Report and Proceedings of the Belfast Natural History and Philosophical Society, 1893-94, 1894-95. } The Society.
- The Journal of the Northamptonshire Natural History Society, Nos. 57, 58, 59, 60. } The Society.
- Journal of the Liverpool Geological Association, vol. xiv. } The Association.
- The Bulletin of the Geological Institution of the University of Upsala, vol. i., Nos. 1 & 2, vol. ii., part 1. } The University.
- University Studies in the University of Nebraska, vol. ii., No. 1. } The University.

- Report of the Meteorological Council to
the Royal Society, for the year ending
31st March, 1894. Meteorological
Charts of the Red Sea, and Daily and
Weekly Weather Reports for 1895. } The Meteorological
Society.
- Proceedings of the Bath Natural History
and Antiquarian Field Club, vol. viii.,
No. 2. } The Club.
- A large Series of Reprints from the
Publications of various Societies, by
Prof. Mc. K. Hughes, M.A. } The Author.
- Transactions of the Academy of St. Louis,
vol. vi., No. 18, vol. vii., Nos. 1, 2, 3. } The Academy.
- Memoirs of the Indian Meteorological
Society, vol. vii., parts 1, 2, 3, 4. } The Society.
- The Bulletin of the Mexican Astronomical
Society for 1895 and Anuario del
Observatorio Astronomico Nacional,
1896, by Angel Anguiano. } The Author.
- Report of the Trustees of the Australian
Museum for the year 1894. } The Trustee.
- Report of the Manchester Museum
(Owen's College) with appendices. } The Committee.
- Annual Report of the Brighton and
Sussex Natural History and Philosophi-
cal Society for 1893-94. } The Society.
- The Biblioteca Nazionale Centrale di
Firenze for 1895. } The Librarian.
- 8 Lithographs of Old Mexican Almanacks. Signor Troncosa.
- The 61st Annual Report of the York
School Natural History Society. } The School.

GEOLOGICAL DEPARTMENT.

- Two Fossils from the Cornbrash of
Scarborough. } Capt. Barstow, R.N.
- 4 Specimens of *Terebratula birdlipensis*
from the Clypeus Grit, Inferior Oolite,
Birdlip, Dorset. } J. F. Walker, M.A.
- A Collection of Fossils from the Lower
Middle Lias of Huntcliff, near Saltburn. } Surgeon-Colonel
Donaldson.
- A Collection of Lias and other Fossils. W. Draper, M.D.
- Skull of *Urus* from Preston, Lancs. Rev. E. Maule Cole.
- Tooth of *Elephas antiquus* from the Old
Beach at Sewerby. } Miss Sleight.

MINERALOGY.

- A specimen of Greenstone from Galway, Ireland. } J. F. Walker, M.A.
 8 specimens of Minerals from Tyrol. Miss Ann Wilson.
 Rocks and Minerals from the Rhine and Cornwall. } Mr. H. M. Platnauer.

ZOOLOGY AND COMPARATIVE ANATOMY.

- A large collection of Recent Shells, and Cabinet containing 24 Drawers. } Mrs. North.
 A pair of Rock Doves shot at Speeton, a pair of Great Black Backed Gulls, a pair of Hooded Crows, a pair of Fieldfares, all from Bridlington. } Mr. Thomas Boynton.
 Two cases of Mounted Birds from Ceylon. Mr. James Gore.
 A young specimen of the Red Throated Diver, shot at East Cottingwith. } Mr. M. R. Bullivant.
 Specimen of a large Moth, *Sphinx convolvuli*, caught in the garden at Hazelbush. } Capt. Barstow, R. N.
 An Indian Gnu in the flesh. C. J. Leyland.
 Specimens of *Hydroporus melanurus* from Skipwith Common, *Hydroporus tristis* from Seamer Moor, *Hydroporus atriceps* and *Calathus micropterus* from Hutton Bushell Moor. } Rev. W. C. Hey.
 A collection of Exotic Butterflies. Miss Harrison.
 A large Hammer Shell, with sponges and sea mats attached } Mr. L. J. Thompson.
 A Glass Bottle and Pannikin with Crustacea attached, dredged from off Heligoland. } Rev. Canon Raine.
 Specimens of *Halesus guttatipennis* from near Pickering. } Mr. G. C. Dennis.

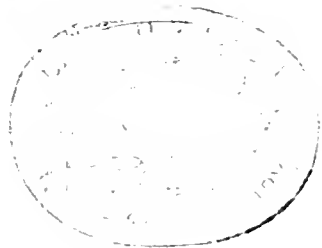
ANTIQUITIES.

- Three fine Mediæval Vessels found at Askham Richard. } Rev. U. B. Miles,
 Askham Richard.
 Four finely carved Stones from the Chapter House of St. Mary's Abbey. } The Committee of the
 School for the Blind.
 A number of Flints from the collection of Mr. Tindal, of Bridlington. } Mr. C. H. Dunhill.

- A fine Cast of the Roman Inscription
found in 1774, at Peak, near Whitby,
and now in the Whitby Museum.
Two stones from Peak, marked with
circles, one is a large slab marked with
several concentric rings, also a pair of
Quern Stones (upper and lower) from
the same place. } Rev. Canon Raine.
- An old Rush-light Lantern. } Rev. A. S. Commeline.
- A collection of Mexican and Maltese
Coins. } Major J. A. Barstow.

BOTANY.

- A small but interesting collection of
Plants, chiefly from the South of
England, collected between the years
1824 and 1832, by Mr. W. Bain. } Rev. Canon Raine.
- Specimens from the neighbourhood of
York, 1840, 1890. } Mr. H. J. Wilkinson.
- Specimens from the South of Ireland,
1894. } Mr. R. A. Phillips.
- Specimens from the South of England,
including *Cardamine bulbifera*, R.Br.,
and *Raphanus maritimus*, Sm. } E. H. Farr and
Mr. T. Hilton.
- Specimen of *Adiantum capillus-veneris*,
Linn., from Cornwall. } Mr. H. M. Platnauer.
- A small series of Indian Ferns. } Mrs. Williamson.
- A collection of Fibres. } Mr. Lund.



CRUCIFERÆ.

73. *Matthiola sinuata*, R.Br.

Sea Stock. (South and West coasts.)

Distrib. W. Europe and N. Africa.

| | DATE. | COLLECTOR. | HERBARIUM. |
|---|--------|--------------------|------------------|
| <i>Sp.</i> Norfolk (<i>alien</i>) | (1810) | D. Turner | Hailstone |
| St. Aubin's Bay (Jersey) | 1836 | S. Hailstone, jun. | Hailstone |
| Swansea (Glamorganshire) | (1800) | D. Turner | Rev. Jas. Dalton |
| Swansea „ | 1820 | J. Dalton | Rev. Jas. Dalton |
| Swansea „ | 1826 | W. Middleton | Middleton |

74. *Matthiola incana*, R.Br.

Hoary Stock (Isle of Wight, Hastings, &c.)

Distrib. W. Europe, Canaries.

| | | | |
|--------------------------------------|--------|------------------|------------------|
| <i>Sp.</i> Channel Islands | 1841 | Dickson | Hailstone |
| Sp. from Dr. Hooker, no locality.. | (1820) | | Rev. Jas. Dalton |
| Campton Cliffs, Freshwater, | | | |
| Isle of Wight | 1891 | J. H. A. Steuart | Wilkinson |

75. *Cheiranthus Cheiri*, Linn.

Wallflower. *Old abbey walls and on limestone crags.*

Distrib. Central and N. Europe.

| | | | |
|---|--------|--------------|------------------|
| <i>Sp.</i> Walls in and about Pontefract, | | | |
| Yorks, Mortham Tower, Rokeby, | | | |
| Yorks. | (1830) | S. Hailstone | Hailstone |
| Walls of the Castle (Loch Leven) | 1824 | J. Dalton | Rev. Jas. Dalton |
| Walls of Morton Hall, Rokeby, | | | |
| Yorks. | (1820) | J. Dalton | Rev. Jas. Dalton |
| Newark Castle, Notts. | 1820 | W. Middleton | Middleton |

**76. Nasturtium officinale,
R.Br.**

Watercress. *Running water.*

Shetland to Channel Islands.

Distrib. Europe, W. Asia, N. Africa.

Sp. In a ditch at the foot of Lister

Hills, towards Silsbridge ..

By the tanhouse, Horton, Yorks. ..

Ditches about Swaffham and Botti-
sham, Cambs. ..

Ditch, Clifton Ings, Yorks. ..

DATE.

COLLECTOR.

HERBARIUM.

1804

S. Hailstone

Hailstone

1806

„

„

1843

„

„

1883

H. J. Wilkinson

Wilkinson

**77. Nasturtium sylvestre,
R.Br.**

Creeping Yellow Cress.

Moist places, from the Tay southwards.

Distrib. Europe, N. Africa, Asia.

Sp. Riverside below Ferrybridge, Yorks.

Banks of the Ure and about Cop-
grove, Yorks

1806

S. Hailstone

Hailstone

1790

J. Dalton

Rev. Jas. Dalton

**78. Nasturtium palustre,
D.C.**

Yellow Cress. *Wet places*, from Clyde
southwards.

Distrib. Europe (Arctic), N. Africa.

Sp. Nr. Yeddingham Bridge, E., Yorks

Bath, Somersetshire ..

Copgrove, Yorkshire ..

1820

W. Middleton

Middleton

1790

J. Dalton

Rev. Jas. Dalton

**79. Nasturtium amphibium
R.Br.**

Great Yellow Cress. *Wet places*,
Yorkshire to Kent.

Distrib. Europe, N. Africa.

| <i>Nasturtium amphibium</i> R.Br. | | | |
|--|--------|-----------------|------------------|
| Sp. | DATE. | COLLECTOR. | HERBARIUM. |
| By the side of the River Wharfe at Poole, Yorkshire | 1802 | S. Hailstone | Hailstone |
| By the riverside, Thorparch, York- shire | 1848 | " | " |
| Copgrove, nr. Borobridge | 1790 | J. Dalton | Rev. Jas. Dalton |
| Clifton Ings, Yorkshire | 1883 | H. J. Wilkinson | Wilkinson |
| 80. Barbarea vulgaris, R.Br. | | | |
| Winter Cress. <i>Hedge-banks and stream- sides</i> , from Aberdeen southwards. | | | |
| <i>Distrib.</i> Arctic Europe, Temp. Asia, N. America. | | | |
| Sp. Thorparch, Yorkshire | 1840 | S. Hailstone | Hailstone |
| Copgrove, nr. Borobridge, Yorks. .. | 1790 | J. Dalton | Rev. Jas. Dalton |
| Yorks. | 1820 | W. Middleton | Middleton |
| 81. Barbarea stricta, Andrz. | | | |
| Winter Cress. <i>Stream-sides</i> . Yorkshire and S.E. Counties. | | | |
| Sp. Clifton Ings, Yorks... .. | 1842 | O. A. Moore | Moore |
| 82. Barbarea præcox, R.Br. | | | |
| American Cress. <i>Roadsides, &c.</i> (alien). | | | |
| <i>Distrib.</i> Throughout Europe. | | | |
| Sp. From Mr. Hustler, who brought it from near Settle, Yorks. .. | (1836) | | Hailstone |
| St. Vincent's Rocks, Bristol .. | 1883 | H. Fisher | Wilkinson |
| 83. Arabis petroea, Lam. | | | |
| Alpine Rock Cress. <i>Alpine rocks</i> , Wales and Scotland. | | | |
| <i>Distrib.</i> N. Europe, N. Asia, and N. America. | | | |
| Sp. From Clogwyn dû r Arddu.. .. | (1798) | Rev. W. Bingley | Rev. Jas. Dalton |

| | DATE. | COLLECTOR. | HERBARIUM. |
|--|--------|-------------------------|------------------|
| 84. <i>Arabis stricta</i>, Huds. | | | |
| Bristol Rock Cress. <i>Rocks</i> , N. Somerset and W. Gloucester. | | | |
| <i>Distrib.</i> Europe, from Spain to Hungary. | | | |
| St. Vincent's rocks, Bristol .. | 1833 | John Howson | Hailstone |
| „ „ „ .. | 1800 | Rev. Archdeacon Pierson | Rev. Jas. Dalton |
| „ „ „ .. | (1826) | Dr. Hooker | „ |
| „ „ „ . | 1830 | J. Dalton | „ |
| „ „ „ .. | 1820 | W. Middleton | Middleton |
| „ „ „ .. | 1882 | H. Fisher | Wilkinson |
| 85. <i>Arabis ciliata</i>, R.Br. | | | |
| Rock Cress. Connemara, W. Ireland, and South Wales. | | | |
| <i>Sp.</i> Seashore near Roundstone, Galway.. | 1838 | Dr. Balfour | Hailstone |
| 86. <i>Arabis hirsuta</i>, Scop. | | | |
| Common Rock Cress. <i>Walls and banks</i> from Aberdeen southward. | | | |
| <i>Disturb.</i> Europe, Temp. Asia, and North America. | | | |
| <i>Sp.</i> | | | |
| Near Eastbourne, Sussex | 1834 | S. Hailstone, jun. | Hailstone |
| Arthur's Seat, Edinboro' .. | 1807 | S. Hailstone | Hailstone |
| Malham and Gordale | | | |
| Hedgebanks Craven, Skipton | | | |
| Castle, Yorkshire | | | |
| Whalley Abbey, Lancashire .. | | | |
| Rocks near the Spa, Thorparch, Yorks. | 1840 | „ | „ |
| Arthur's Seat, Edinboro' | 1830 | G. Munby | Munby |
| Walls at Vosterberg, Co. Cork .. | 1892 | R. A. Phillips | Wilkinson |
| Beverley, Yorkshire | 1790 | R. Teesdale | Rev. Jas. Dalton |
| Burton Mills, Derbyshire | (1830) | Prof. Henslow | „ |
| Near Ripon, Yorkshire | 1800 | J. Dalton | „ |
| Croft „ | 1820 | „ | „ |
| Near the Mill, Heslington, Yorks. .. | 1883 | H. J. Wilkinson | Wilkinson |
| Hovingham, Yorkshire | 1890 | „ | „ |

| | DATE. | COLLECTOR. | HERBARIUM. |
|---|-----------------|-----------------|------------------|
| 87. Arabis Turrita, Linn. | | | |
| Tower Cress. <i>Naturalized on walls.</i> | | | |
| <i>Distrib.</i> Central and S. Europe. | | | |
| <i>Sp.</i> Walls of Trinity College, Cambs. . . | 1820 | S. Hailstone | Hailstone |
| „ „ „ . . . | 1830 | Prof. Henslow | Rev. Jas. Dalton |
| Walls of S. John's College, „ . . | 1787 | J. Dalton | Rev. Jas. Dalton |
| Walls of Trinity College, Cambridge, near the door leading into the cloisters from the walks | May 18, 1803 | J. Dalton | Rev. Jas. Dalton |
| 88. Arabis perfoliata, Lam | | | |
| Tower Mustard. <i>Dry banks and rocky places (local).</i> | | | |
| <i>Distrib.</i> Europe (Arctic), Temp. Asia, and North America. | | | |
| <i>Sp.</i> Fields near Ripon | 1800 | W. Brunton | Hailstone |
| Near the Spa, Thorparch, Yorks. . . | 1843 | S. Hailstone | Hailstone |
| Copgrove, nr. Borobridge „ . . | 1790 | J. Dalton | Rev. Jas. Dalton |
| On the right of the road from Green- hammerton to Borobridge, Yorks. | 1820 | W. Middleton | Middleton |
| Near Richmond, Yorks. | 1830 | J. Warde | Rev. Jas. Dalton |
| 89. Cardamine amara, Linn. | | | |
| Common Bitter Cress. <i>Moist meadows by Streams, from Aberdeen southward.</i> | | | |
| <i>Distrib.</i> N. Europe and N. Asia. | | | |
| <i>Sp.</i> Trench Wood; Nr. Hebden Bridge, Yorkshire; by the side of the fish ponds at Bierley, Yorkshire . . | 1814 | S. Hailstone | Hailstone |
| Near the Spa, Thorparch, and plen- tifully by the brook which runs by the Mill into the river, and marshy ground adjoining . . | 1832 1848 | „ | „ |
| Ditch, Clifton Ings, Yorks. . . | 1883 | H. J. Wilkinson | Wilkinson |
| Copgrove, nr. Borobridge, Yorks. . . | 1790 | J. Dalton | Rev. Jas. Dalton |

| | DATE. | COLLECTOR. | HERBARIUM. |
|---|-------|-----------------|------------------|
| 90. Cardamine pratensis, Lam. | | | |
| Cuckoo-Flower. <i>Moist meadows</i> from Shetland southward. | | | |
| <i>Distrib.</i> N. Temp. and Arctic regions. | | | |
| <i>Sp.</i> Thorparch, Yorkshire | 1840 | S. Hailstone | Hailstone |
| Copgrove, nr. Borobridge, Yorks. .. | 1790 | J. Dalton | Rev. Jas. Dalton |
| 91. Cardamine hirsuta, Linn. | | | |
| Hairy Bitter Cress. <i>Damp places</i> , Shetland southward. | | | |
| <i>Distrib.</i> N. Temp. and Arctic regions. | | | |
| <i>Sp.</i> Horton, Bradford, Yorkshire .. | 1830 | S. Hailstone | Hailstone |
| Ripon | 1820 | J. Dalton | Rev. Jas. Dalton |
| York | 1820 | W. Middleton | W. Middleton |
| Croft, Yorks... .. | 1830 | J. Dalton | Rev. Jas. Dalton |
| 92. Cardamine flexuosa, With. | | | |
| Sylvan Bitter Cress. <i>Moist copses</i> . | | | |
| <i>Distrib.</i> N. and Temp. regions. | | | |
| <i>Sp.</i> Oxtun Bogs, Notts. | 1892 | H. J. Wilkinson | Wilkinson |
| 93. Cardamine impatiens, Linn. | | | |
| Mountain Bitter Cress. | | | |
| <i>By mountain streams and shady copses</i> , Westmoreland southward. | | | |
| <i>Distrib.</i> Europe, Temp. Asia. | | | |
| <i>Sp.</i> Settle, Yorkshire | 1798 | R. Teesdale | Rev. Jas. Dalton |
| Near Settle, Yorkshire | 1840 | Mr. Hustler | Hailstone |
| Near Bath, Somersetshire | 1824 | W. Middleton | Middleton |
| Glen, Frome, | 1884 | H. Fisher | Wilkinson |

| | DATE. | COLLECTOR. | HERBARIUM. |
|---|--------|-----------------|------------------|
| 94. Cardamine bulbifera, R.Br. | | | |
| Coral-root. <i>Woods and shady places</i> from Stafford to Kent and Sussex. | | | |
| <i>Distrib.</i> Europe. | | | |
| <i>Sp.</i> Harefield Park Wood, Middlesex .. | (1843) | A. Henfrey | Hailstone |
| Middlesex | (1800) | R. Teesdale | Rev. Jas. Dalton |
| Tunbridge Wells, Kent | 1798 | „ | „ |
| „ | (1800) | D. Turner | „ |
| Tidebrook-Wadhurst, Sussex .. | 1895 | E. H. Farr | Wilkinson |
| Harefield Park, Middlesex .. | (1800) | Dr. Goodenough | Rev. Jas. Dalton |
| 95. Alyssum calycinum, Linn. | | | |
| Rigid Alyssum. (<i>Cultivated fields.</i>) | | | |
| <i>Distrib.</i> Central and S. Europe | | | |
| <i>Sp.</i> Sandy fields, Nether Poppleton, York | 1883 | H. J. Wilkinson | Wilkinson |
| 96. Alyssum maritimum, Linn. | | | |
| Sweet Alyssum. <i>Banks near the sea.</i> | | | |
| <i>Distrib.</i> S. Europe and W. Asia. | | | |
| <i>Sp.</i> North Shore, Liverpool | 1840 | Mr. Gibson | Hailstone |
| Budleigh Salterton, Devonshire .. | (1824) | Dr Hooker | Rev. Jas. Dalton |
| Swansea, probably an escape from some garden | 1824 | W. Middleton | Middleton |
| 97. Draba muralis, Linn. | | | |
| Wall Whitlow grass. <i>Limestone rocks and walls</i> from Yorkshire to Somersetshire. | | | |
| <i>Distrib.</i> Europe, Temp. Asia, N. Africa. | | | |
| <i>Sp.</i> Malham Cove, Yorkshire | 1810 | S. Hailstone | Hailstone |
| | 1832 | | |
| Malham | 1840 | Mr. Hustler | „ |
| Malham | 1883 | H. J. Wilkinson | Wilkinson |
| Near Settle, Yorkshire | 1820 | W. Middleton | Middleton |
| From a wall at Greenwich (<i>alien</i>) .. | 1824 | „ | „ |
| Malham, Yorkshire | 1820 | J. Dalton | Rev. Jas. Dalton |
| Ingleton and Settle, Yorkshire .. | 1840 | H. Baines | Walker |

| | DATE. | COLLECTOR. | HERBARIUM. |
|--|---------|-----------------|------------------|
| 98. <i>Draba incana</i>, Linn. | | | |
| (Twisted-pod) Whitlow grass. | | | |
| <i>Alpine rocks</i> , Scotland, N. England, Wales, and W. Ireland. | | | |
| <i>Distrib.</i> Alpine and Arctic Europe. | | | |
| <i>Sp.</i> Cronkley Fell, Yorkshire | 1826 | S. Hailstone | Hailstone |
| Malham and Settle, Yorkshire | 1840 | Mr. Hustler | „ |
| About Settle, Yorkshire | 1840 | J. Tatham | „ |
| Teesdale and Settle, Yorkshire | 1840 | H. Baines | Walker |
| Malham Cove, Yorkshire | 1800-20 | J. Dalton | Rev. Jas. Dalton |
| Cronkley Fell, Yorkshire | 1883 | H. J. Wilkinson | Wilkinson |
| 99. <i>Draba rupestris</i>, R.Br. | | | |
| Highland Whitlow grass. | | | |
| <i>Alpine rocks</i> , Scotland. | | | |
| <i>Distrib.</i> Arctic regions. | | | |
| <i>Sp.</i> Ben Lawers, Perthshire | 1826 | S. Hailstone | Hailstone |
| „ „ „ | 1820 | J. Dalton | Rev. Jas. Dalton |
| „ „ „ | 1820 | W. Middleton | Middleton |
| „ „ „ | 1883 | A. E. Lomax | Wilkinson |
| 100. <i>Draba aizoides</i>, Linn. | | | |
| Yellow Whitlow grass. | | | |
| <i>Rocks and walls</i> , Pennard Castle, Swansea. | | | |
| <i>Distrib.</i> Central and S. Europe. | | | |
| <i>Sp.</i> Pennard Castle, nr. Swansea | (1810) | Mr. Sowerby | Hailstone |
| „ „ „ | (1810) | D. Turner | Rev. Jas. Dalton |
| 101. <i>Erophila vulgaris</i>, D.C. | | | |
| Whitlow grass. <i>Walls, paths, &c.</i> , from Orkney to Channel Islands. | | | |
| <i>Distrib.</i> Temp. Europe, Asia, &c. | | | |
| <i>Sp.</i> Thorparch, Yorkshire | 1843 | S. Hailstone | Hailstone |
| Copgrove, nr. Borobridge, Yorks. .. | 1790 | J. Dalton | Rev. Jas. Dalton |
| York | 1824 | W. Middleton | Middleton |
| York | 1838 | H. Baines | Walker |
| 102. <i>Erophila inflata</i>, Hook. | | | |
| <i>Sp.</i> From Ben Lawers, Perthshire. .. | 1830 | Dr. Hooker | Rev. Jas. Dalton |

| | DATE. | COLLECTOR. | HERBARIUM. |
|---|--------------|-----------------|------------------|
| 103. Cochlearia officinalis, Linn. | | | |
| Common Scurvy grass. <i>Muddy sea shores</i> , from Shetland to Channel Islands. | | | |
| <i>Distrib.</i> N. W. Europe, Polar regions. | | | |
| <i>Sp.</i> (Wall ?) at Mansfield, Notts. . . | 1820 | . Middleton | Middleton |
| Scarborough Castle, Yorkshire . . | 1820 | „ | „ |
| 104. Cochlearia alpina, H. C. Watson. | | | |
| Alpine Scurvy grass. | | | |
| <i>Sp.</i> Teesdale, &c. | 1838 | H. Baines | Walker |
| Hackfall, Ripon | 1830 | J. Dalton | Rev. Jas. Dalton |
| Cronkley Fell, Yorkshire | 1883 | H. J. Wilkinson | Wilkinson |
| Ben-y-Gloe, Perthshire | 1820 | W. Middleton | Middleton |
| 105. Cochlearia danica, Linn. | | | |
| Scurvy grass. <i>Sandy and muddy shores</i> , from Aberdeen southward. | | | |
| <i>Sp.</i> Walney Island | 1840 | Mr. Hustler | Hailstone |
| Walls of Peel Castle, Isle of Man . . | June 24, '41 | S. Hailstone | „ |
| South Denes, Yarmouth | 1843 | „ | „ |
| Northam Burrows, nr. Bideford . . | 1850 | G. Mann | „ |
| Roches Point, Cork Harbour . . . | 1894 | R. A. Phillips | Wilkinson |
| Nr. Ilfracombe, Devonshire . . . | 1883 | H. Fisher | „ |
| Aberystwith (Cardiganshire) | 1820 | W. Middleton | Middleton |
| 106. Cochlearia anglica, Linn. | | | |
| Scurvy grass. <i>Muddy sea shores</i> , from W. Scotland to Channel Islands. | | | |
| <i>Sp.</i> From the banks of the River Tawe, near Swansea | May, 1803 | Sowerby | Hailstone |
| Rochestown, County Cork | 1894 | R. A. Phillips | Wilkinson |
| Sittingbourne, Kent | (1824) | W. Middleton | Middleton |

107. *Cochlearia Armoracia*, Linn.

Horse Radish. (*Field corners, &c., alien.*)

| | | | |
|--|------|----------------|-----------|
| <i>Sp.</i> By the side of the canal in the Springs, Skipton, Yorkshire .. | 1810 | S. Hailstone | Hailstone |
| By the side of the road just going out of Skipton to Guisbro', Yorks. | 1811 | " | " |
| Tivoli, County Cork | 1892 | R. A. Phillips | Wilkinson |
| Battersea fields, Surrey | 1820 | W. Middleton | Middleton |

108. *Hesperis matronalis*, Linn.

Dame's Rocket (*alien*).

| | | | |
|---|------|--------------|--------------------------|
| <i>Sp.</i> By the brookside near the Bridge { below Kiddall Hall } | 1808 | S. Hailstone | { Catalogue Hailstone |
| In the hedge between Skipton and { Gargrave, Yorkshire } | | | " |
| In the hedge going into Oglethorpe { Ings, Boston, Yorkshire .. } | | | " |

109 *Sisymbrium Thalianum*. J. Gay.

Thale Cress. *Dry banks*, from Orkney
southward.

Distrib. Europe (Arctic), N. Africa.

| | | | |
|--|------|-----------------|------------------|
| <i>Sp.</i> Hedge bank near Ripon | 1800 | Mr. Brunton | Hailstone |
| Ulverston, Lancashire | 1830 | Mr. Hustler | " |
| Sandy lane, near Nether Poppleton, York | 1883 | H. J. Wilkinson | Wilkinson |
| Tivoli, County Cork | 1891 | R. A. Phillips | " |
| Copgrove, nr. Borobridge, Yorkshire | 1790 | J. Dalton | Rev. Jas. Dalton |

110. *Sisymbrium officinale*, Scop.

Hedge Mustard. *Hedge banks, &c., from*
Orkney southward, Europe, W. Asia.

| | | | |
|--------------------------------------|------|--------------|------------------|
| <i>Sp.</i> Copgrove, Yorkshire | 1790 | J. Dalton | Rev. Jas. Dalton |
| Thorparch, Yorkshire | 1840 | S. Hailstone | Hailstone |

| | DATE. | COLLECTOR. | HERBARIUM. |
|---|--------|---------------|------------------|
| 111. <i>Sisymbrium polyceratum</i>, Linn. | | | |
| Bury Hedge Mustard. | | | |
| <i>Bury St. Edmunds</i> : "Introduced by Dr. Goodenough"—Sir J. D. Hooker. | | | |
| <i>Sp.</i> Naturalized in the streets of Bury St. Edmunds | 1840 | Dr. Bromfield | Hailstone |
| Schoolhouse lane, Bury St. Edmunds | 1843 | S. Hailstone | ,, |
| Bury St. Edmunds | 1820 | ,, | Rev. Jas. Dalton |
| 112. <i>Sisymbrium Sophia</i>, Linn | | | |
| Flixweed. <i>Waste places</i> , from Caithness southward. | | | |
| <i>Sp.</i> From Coatham, Bridlington .. | 1799 | S. Hailstone | Hailstone |
| Redcar, Yorkshire .. | 1826 | J. Dalton | Rev. Jas. Dalton |
| 113. <i>Sisymbrium Irio</i>, Linn. | | | |
| London Rocket. <i>Walls of ancient towns</i> , from Berwick to Channel Islands. | | | |
| <i>Distrib.</i> Central and S. Europe, W. Asia. | | | |
| <i>Sp.</i> Walls of Berwick-upon-Tweed .. | 1800 | Mr. Brunton | Hailstone |
| Ramparts of Berwick-upon-Tweed .. | 1830 | J. Dalton | Rev. Jas. Dalton |
| Do do. .. | (1830) | Prof. Henslow | ,, |
| 114. <i>Sisymbrium Alliaria</i>, Scop. | | | |
| Sauce alone. <i>Hedge banks</i> , from Ross southward. | | | |
| <i>Distrib.</i> Europe and N. Africa ; W. Asia. | | | |
| <i>Sp.</i> York | 1820 | W. Middleton | Middleton |
| 115. <i>Erysimum cheiranthoides</i>, Linn. | | | |
| Wormseed. <i>Waste places in the Fens, &c.</i> | | | |
| <i>Distrib.</i> Europe (Arctic). | | | |
| <i>Sp.</i> Bottisham Fen, Cambs. | 1843 | S. Hailstone | Hailstone |
| Common in every ploughed field in Bottisham (Cambs) | 1845 | ,, | ,, |
| Snailwell, Cambs. | 1830 | J. Dalton | Rev. Jas. Dalton |
| Banks of the Avon, nr. Bath .. | 1820 | W. Middleton | Middleton |

| | DATE. | COLLECTOR. | HERBARIUM. |
|---|--------|-------------------|------------------|
| 116. Erysimum perfoliatum Crantz. | | | |
| Specimens (no localities) | (1826) | ? | Rev. Jas. Dalton |
| 117. Camelinasativa, Crantz | | | |
| Gold of Pleasure. <i>Flaxfields (Sporadic).</i> | | | |
| <i>Distrib.</i> Europe and Temp. Asia. | | | |
| <i>Sp.</i> In a field at Nocton (Lincolnshire) | 1814 | Miss Stovins | Hailstone |
| Camelina Ev-sativa, Syme. | | | |
| <i>Sp.</i> Near Pontefract (Yorkshire) .. | 1838 | H. Baines | Walker |
| Forfar in Angusshire | (1800) | Donn | Rev. Jas. Dalton |
| 118. Subularia aquatica, Linn. | | | |
| Water Awlwort. <i>Alpine lakes, N. Wales, Scotland, &c.</i> | | | |
| <i>Distrib.</i> Arctic, N. Europe, N. Asia. | | | |
| <i>Sp.</i> Loch Lubnaig, Perthshire | 1843 | Mr. Brand | Hailstone |
| Loch of Butterstone, Delvine, Perthshire | 1820 | Miss Watson | Middleton |
| Lake near Llanberis, N. Wales .. | 1879 | J. E. Griffith | Wilkinson |
| 119. Brassica oleracea, Linn. | | | |
| Wild Cabbage. <i>Cliffs by the sea W. and S. E. coasts.</i> | | | |
| <i>Distrib.</i> West and South coasts of Europe. | | | |
| <i>Sp.</i> From Staithes, between Whitby and Redcar, Yorks. | 1830 | S. Hailstone | Hailstone |
| Cliffs near Sandgate, Kent (rare) .. | 1847 | Miss J. Hailstone | „ |
| Cliffs upon Ormes Head, N. Wales | (1830) | Prof. Henslow | Rev. Jas. Dalton |
| Walmer, Kent | 1830 | „ | „ |
| Cliffs, Dover ; Whitby, Yorks. .. | 1820 | W. Middleton | Middleton |
| Whitby, Yorkshire | 1882 | H. J. Wilkinson | Wilkinson |
| 120. Brassica Napus, Linn. | | | |
| Rape. <i>Field borders.</i> | ? | ? | Rev. Jas. Dalton |

| | DATE. | COLLECTOR. | HERBARIUM. |
|---|------------|----------------|------------------|
| 121. Brassica Rapa, Linn. | | | |
| Turnip. <i>Waste places.</i> | | | |
| <i>Sp.</i> By the side of the Bradford brook below the town. | 1800 | S. Hailstone | Hailstone |
| Burgh Castle, Suffolk | 1843 | " | " |
| Croft, Yorkshire | 1830 | J. Dalton | Rev. Jas. Dalton |
| 122. Brassica monensis, Huds. | | | |
| Isle of Man Cabbage. <i>Western Coasts.</i> | | | |
| <i>Distrib.</i> W. & S. Europe. | | | |
| <i>Sp.</i> Blackpool and Lytham, Lancashire. | June 24th. | } S. Hailstone | Hailstone |
| Castle Mona, Isle of Man | 1841 | | |
| Lytham, Lancashire | 1830 | Prof. Henslow | Rev. Jas. Dalton |
| Hebrides | 1830 | ? | " |
| Lytham, Lancashire | 1830 | J. Dalton | " |
| 123. Brassica Sinapiodes, Roth. | | | |
| Black Mustard (<i>river banks and waste places</i>). | | | |
| <i>Sp.</i> | 1830 | J. Dalton | Rev. Jas. Dalton |
| 124. Brassica Sinapistrum, Boiss. | | | |
| Charlock. <i>Cornfields.</i> | | | |
| <i>Distrib.</i> Europe; N. Africa. | | | |
| <i>Sp.</i> Thorparch, Yorkshire | 1840 | S. Hailstone | Hailstone |
| 125. Brassica alba, Boiss. | | | |
| White mustard. <i>Cultivated ground.</i> | | | |
| <i>Distrib.</i> N. Africa; Europe. | | | |
| Croft, Yorkshire | 1830 | J. Dalton | Rev. Jas. Dalton |

126. *Diplotaxis tenuifolia*, DC.

Narrow leaved wall mustard.

Waste places from Northumberland
southward.

Distrib. Europe ; N. Africa.

| | | | |
|---|-----------------------------|--------------------|------------------|
| <i>Sp.</i> Walls of Chester and Southampton.. | } June and July, 1840 | S. Hailstone, jun. | Hailstone |
| Walls of Tynemouth Priory & Castle | | | |
| Ballast hills, Jarrow (Durham) .. | | | |
| Yarmouth churchyard | 1843 | " | " |
| Near London ; walls of Pontefract.. | (1820) | J. Dalton | Rev. Jas. Dalton |
| Dunwich, Suffolk | 1830 | Prof. Henslow | " |
| Blackrock gully, near Bristol .. | 1883 | H. Fisher | Wilkinson |

127. *Diplotaxis muralis*, DC.

Waste places from Roxburgh southward.

Distrib. W. Europe and Belgium
southward.

| | | | |
|--|---------|--------------|------------------|
| <i>Sp.</i> South Denes, Yarmouth | 1843-46 | S. Hailstone | Hailstone |
| Cornfield, Margate, Kent | 1820 | W. Middleton | Middleton |
| Broadstairs, Kent | 1830 | Borrer | Rev. Jas. Dalton |
| Near Bristol | 1883 | H. Fisher | Wilkinson |

128. *Diplotaxis muralis*, DC. var. *Babingtonii* Syme.

Sandy ground, South of England.

Black-rock gully, Bristol 1883 H. Fisher Wilkinson

129. *Bursa*, *Bursa-pastoris*, Weber.

Shepherd's Purse. *Dry ground*, from
Orkney southwards.

Distrib. Temp. and Arctic Europe, N.
Africa.

| | | | |
|-----------------------------------|------|--------------|------------------|
| <i>Sp.</i> Copgrove, Yorks. | 1790 | J. Dalton | Rev. Jas. Dalton |
| York | 1820 | W. Middleton | Middleton |
| Boston Spa, Yorks. | 1840 | S. Hailstone | Hailstone |

| | DATE. | COLLECTOR. | HERBARIUM. |
|---|-------|----------------|------------------|
| 130. <i>Coronopus didymus</i>, Sm. | | | |
| Wart Cress. <i>Waste ground</i> , near the sea from Fife southward. | | | |
| <i>Distrib.</i> S. America (a colonist elsewhere, Sir J. D. Hooker). | | | |
| <i>Sp.</i> Near Exeter and Swansea | 1820 | J. Dalton | Rev. Jas. Dalton |
| Devonshire | 1830 | Dr. Emerson. | Hailstone |
| Devonshire | 1820 | J. Dalton | Rev. Jas. Dalton |
| Crosshaven, Co. Cork | 1892 | R. A. Phillips | Wilkinson |
| 131. <i>Coronopus Ruelii</i>, All. | | | |
| Swine's Cress. <i>Waste ground</i> , from Caithness southward. | | | |
| <i>Distrib.</i> Europe and N. Africa. | | | |
| <i>Sp.</i> Behind the County Hospital, out of Monk Bar, York.. .. | 1840 | S. Hailstone | Hailstone |
| Yarmouth Churchyard | 1843 | " | " |
| Bottisham, Cambs. | 1845 | " | " |
| Scarborough Old Pier | 1820 | W. Middleton | Middleton |
| 132. <i>Lepidium latifolium</i>, Linn. | | | |
| Dittander. <i>Salt marshes</i> , N.E. England, Norfolk and Wales. | | | |
| <i>Distrib.</i> Mid. and S. Europe, W. Asia. | | | |
| <i>Sp.</i> Coatham, Seaton, &c., Yorks. .. | 1830 | S. Hailstone | Hailstone |
| Cork Beg Island, Cork Harbour .. | 1893 | R. A. Phillips | Wilkinson |
| Sandsend, Whitby, Yorks. .. | 1838 | H. Baines | Walker |
| Berrow Sandbank, Somersetshire .. | 1883 | H. Fisher | Wilkinson |
| 133. <i>Lepidium ruderales</i>, Linn. | | | |
| Narrow-leaved Pepper Cress. <i>Waste places</i> , near the sea, Fife to Cornwall. | | | |
| <i>Distrib.</i> Europe and N.W. Asia. | | | |
| <i>Sp.</i> Scarborough, Yorks. | 1840 | J. Backhouse | Hailstone |
| Scarborough and Redcar | 1838 | H. Baines | Walker |
| Scarborough | 1820 | W. Middleton | Middleton |
| Bristol | 1820 | J. Dalton | Rev. Jas. Dalton |

| | DATE. | COLLECTOR. | HERBARIUM. |
|--|--------------------|---------------|------------------|
| 135. <i>Lepidium campestre</i>, R.Br. | | | |
| Pepperwort. <i>Dry fields and waysides.</i> | | | |
| <i>Distrib.</i> Europe, N. Africa. | | | |
| <i>Sp.</i> Acomb, York | 1827 | S. Hailstone | Hailstone |
| Cliffs near Bradford, on the road to Bolton, Yorkshire | | | |
| Tarlton Bridge | 1831 | „ | „ |
| 136. <i>Lepidium hirtum</i>, Sm. | | | |
| <i>Sp.</i> Cornfields, Hastings | 1834 | S. Hailstone | Hailstone |
| Darlington | 1840 | J. Backhouse | „ |
| Yarmouth and Brighton | 1820 | J. Dalton | Rev. Jas. Dalton |
| Ayreshire | 1830 | Prof. Henslow | „ |
| Acomb, York | 1827 | S. Hailstone | Hailstone |
| 137. <i>Lepidium Draba</i>, Linn. | | | |
| Whitlow Pepper Cress. | | | |
| <i>Fields, hedgebanks, &c. (alien).</i> | | | |
| <i>Distrib.</i> S. E. Europe, W. Asia. | September, 1841 | W. Newbould | Hailstone |
| <i>Sp.</i> Guernsey | | | |
| 138. <i>Thlaspi arvense</i>, Linn. | | | |
| Penny Cress. <i>Cultivated fields.</i> | | | |
| <i>Distrib.</i> Europe, N. Africa, N. & W. Asia. | | | |
| <i>Sp.</i> Leyburn, Wensleydale | (1830) | J. Ward | Hailstone |
| Near Croft, Yorkshire | 1830 | J. Dalton | Rev. Jas. Dalton |
| Cornfields, Knapton, nr. York | (1820) | W. Middleton | Middleton |
| Rudham, Norfolk | (1820) | J. Dalton | Rev. Jas. Dalton |
| Castle Howard, &c., Yorkshire | 1838 | H. Baines | Walker |
| 139. <i>Thlaspi perfoliatum</i>, Linn. | | | |
| Perfoliate Penny Cress. | | | |
| <i>Limestone pastures in Oxfordshire and Gloucestershire.</i> | | | |
| <i>Distrib.</i> Mid. and S. Europe, N. Africa. | | | |
| <i>Sp.</i> Cirencester (Gloucestershire) | (1840) | Stark | Hailstone |
| (Burford) Oxfordshire | (1800) | Mr. Donn | Rev. Jas. Dalton |

140. *Thlaspi alpestre*, var. *occitanum*, Jord.

Alpine Penny Cress. *Mountain pastures*
England, Wales, and Scotland.

Distrib. Europe; Himalaya.

| | | | |
|---|------|-----------------|-----------|
| <i>Sp.</i> Malham, near the Tarn, Yorkshire .. | 1820 | S. Hailstone | Hailstone |
| On the left as you enter the pasture going to the Cove (Malham) .. | 1832 | „ | „ |
| Near Langdon Beck, Teesdale, Durham | 1883 | H. J. Wilkinson | Wilkinson |
| Near Carperby, Wensleydale .. | 1892 | A. Wilkinson | „ |
| Ingleborough (Yorkshire) | 1838 | H. Baines | Walker |

141. *Iberis amara*, Linn.

Candytuft. *Cornfields*, E. England.

Distrib. W. Europe.

| | | | |
|---|------|-------------|-----------|
| <i>Sp.</i> In Mr. Hustler's farm at Stockton Common, near York | 1830 | Mr. Hustler | Hailstone |
|---|------|-------------|-----------|

**142. *Teesdalia nudicaulis*,
R.Br.**

Sandy places from Scotland southward.

Distrib. Europe, N. Africa, W. Asia.

| | | | |
|---------------------------------|--------|-----------------|------------------|
| <i>Sp.</i> From Norwich | 1820 | J. Backhouse | Hailstone |
| Pudsey Delves | 1840 | Stanhauer. | „ |
| Langwith, near York | 1820 | W. Middleton | Middleton |
| Croft, Yorkshire | 1820 | J. Dalton | Rev. Jas. Dalton |
| Oxton, Notts. | 1892 | H. Fisher | Wilkinson |
| Langwith, near York | 1890 | H. J. Wilkinson | „ |
| Bulmer, Yorkshire | 1838 | H. Baines | „ |
| Lane near Hutton Moor, Ripon .. | (1805) | J. Dalton | Rev. Jas. Dalton |
| „ „ „ .. | „ | W. Brunton | Middleton |

143. Hutchinsia petroëa
R.Br.

Limestone rocks Dumfries to Somersetshire.

Distrib. Europe, N. Africa.

| | DATE. | COLLECTOR. | HERBARIUM. |
|---|-----------|--------------|------------------|
| <i>Sp.</i> Settle, Yorkshire | 1840 | J. Tatham | Walker |
| Pennarth Castle, eight miles west of Swansea | May, 1803 | Mr. Sowerby | Hailstone |
| Rocks at Malham Cove and Tarn, Yorkshire | 1840 | J. Howson | „ |
| Upon the ledge of the Cove .. | 1840 | S. Hailstone | „ |
| St. Vincent's Rock, Bristol | 1884 | H. Fisher | Wilkinson |
| „ „ „ .. | 1824 | W. Middleton | Middleton |
| St. Vincent's Rock, Bristol | 1786 | J. Dalton | Rev. Jas. Dalton |
| Waterfall nr. Burton in Bishopdale, Yorkshire | 1820 | „ | „ |

144. Isatis tinctoria, Linn.

Woad, Tewkesbury, &c.

Distrib. Europe, N. Asia.

| | | | |
|---|--------|--------------|------------------|
| <i>Sp.</i> Chalk pits, Guildford, Surrey .. | (1800) | J. Dalton | Rev. Jas. Dalton |
| Near Ramsgate, Kent | 1820 | W. Middleton | Middleton |

145. Crambe maritima,
Linn.

Sea-Kale. *Sea coasts* from Fife southward.

Distrib. From Finland to the Black Sea.

| | | | |
|--------------------------------------|------|----------------|-----------|
| <i>Sp.</i> Dunkettle, Co. Cork | 1892 | R. A. Phillips | Wilkinson |
| Shoreham, Sussex | 1820 | W. Middleton | Middleton |
| Coatham, Yorkshire | 1838 | H. Baines | Hailstone |

| | DATE. | COLLECTOR. | HERBARIUM. |
|--|------------|--------------------|------------|
| 146. Cakile maritima, Scop. | | | |
| Sea Rocket. <i>Sandy shores</i> from Shetland to Channel Islands. | | | |
| <i>Distrib.</i> Europe, N. Africa. | | | |
| <i>Sp.</i> Coatham and Redcar, Yorkshire .. | 1799 | S. Hailstone | Hailstone |
| South Sands, Bridlington, Ow- thorpe, &c... .. | 1820 | " | " |
| Fleetwood, Lancashire | 1820 | " | " |
| Yarmouth | 1842 | " | " |
| Walker Ballast Hills, Banks of the Tyne, Northumberland | 1839 | H. Baines | Walker |
| Whitby, Yorkshire | 1820 | W. Middleton | Middleton |
| Tunstall, near Withernsea, Yorkshire | 1892 | H. J. Wilkinson | Wilkinson |
| 147. Raphanus Raphanistrum, Linn. | | | |
| Wild Radish. <i>Cornfields</i> , from Shetland to Channel Islands. | | | |
| <i>Distrib.</i> Europe (Arctic) N. Africa; N.W. Asia.. .. . | | | |
| <i>Sp.</i> Yorkshire | 1820 | W. Middleton | Middleton |
| 148. Raphanus maritimus, Sm. | | | |
| Radish. <i>Sandy and rocky shores</i> from Fife southwards. | | | |
| <i>Distrib.</i> W. Europe. | | | |
| <i>Sp.</i> Chalk cliffs at Beachy Head .. | Sep, 1834 | S. Hailstone, jun. | Hailstone |
| Southwick, Sussex. | Sep., 1895 | Hilton | Wilkinson |

*ON A PYRITIOUS CONCRETION FROM THE LIAS
of Whitby, which appears to show the external form of the
body of embryos of a species of Plesiosaurus.*

By H. G. SEELEY, F.R.S.

In 1887 I received a fossil from J. F. Walker, Esq., M.A., F.G.S., which he had obtained from a dealer at Whitby. It appeared at first to be mineralized with phosphate of lime, but has since proved to consist of iron pyrites, which has obliterated whatever evidence there may have been of internal structure. Upon the surface of the concretion are several elongated forms in high relief, almost as well rounded and well defined as though they were artificially modelled, which I regarded as embryos of a Plesiosaurus. As such the specimen was exhibited and briefly described at the meeting of the British Association in 1887, at Manchester—Report, page 697. I am still unable to interpret the specimen in any other way; it therefore seems desirable to record its essential characters.

The specimen is a central concretionary mass of compact iron pyrites with microcrystalline texture. The surface of this iron pyrites was covered, and is in part still covered, with a smooth film of hard clay. This film has much the aspect of a defining membrane of a placenta-like character, upon which the embryos are clustered and elevated, so as to exhibit curved forms of well-rounded bodies, which correspond to the main contours of the concretion, above which they are for the most part prominently elevated. There are four principal masses, each of which may be regarded as an embryonic plesiosaur; and in addition to these there are indications of three or four others. They partly overlap each other, are in various stages of preservation and of development, and are chiefly interesting for showing the external form of the body as it may be presumed to have been at the time when the parent animal died.

There are many examples of preservation, for a time at least, of the soft parts of animals in various geological deposits. The Solenhofen slate has yielded specimens which demonstrate the forms and structures of Pterodactyle's wings, of bird's feathers, of jelly-fish, and cuttle-fish. These remains prove that there is no *a priori* improbability of the external form of the soft parts

of an animal being preserved. The Lias itself has yielded from many localities evidences of the skin in Ichthyosaurs, and the beautiful example of a Wurtemberg Ichthyosaur, figured by Dr. Eberhard Fraas, demonstrates that the skin need not follow the contours of the bones, since the high dorsal and caudal fins are preserved. All that appears to be required for the preservation of such soft parts is the absence of bacteria, by which decomposition is brought about; and it may be a reasonable inference that there is a greater probability of an embryo being free from the influence of agencies which cause decomposition than most vertebrate structures.

In this specimen decomposition appears however to have taken place after a time. After the external form may have been moulded, the internal tissue appears to have been replaced by iron pyrites; for vertical sections of the neck of one of these supposed foetal plesiosaurs have been prepared from one of the fragmentary specimens, without giving any evidence of internal structure beyond a small central canal. After carefully comparing these slices with corresponding sections from the neck of embryos of reptiles, which Adam Sedgwick, Esq., F.R.S., has had the kindness to have prepared at my request, in his laboratory in the University of Cambridge, I am unable to affirm that even the central canal in the fossil is manifestly identical with any structure in existing animals. The longitudinal section of the neck, when seen under the microscope, is equally devoid of evidence of segmentation, such as might have been expected, though the longitudinal canal shows a uniform width, and presumably has some relation, if not to original structures, at least to mineralization. This evidence of internal structure, having failed, I have not thought it necessary to slice up the specimen in the way originally contemplated.

The evidence for the organic origin of the specimens is essentially that contributed by their external forms; but not one example is sufficiently perfect to show all the details. Each of the four principal specimens is characterized by a median longitudinal ridge or blunt angle which extends down the neck, body, and tail, upon what I regard as the dorsal surface; corresponding in position to the neural spines of the vertebræ. In the example numbered 1, in which the head is

preserved, this ridge commences immediately behind the head, and is traced down the length of the neck, but the back is so far worn that it is not clearly seen in the dorsal region. In the specimen numbered 2, in which only a small part of the neck is exposed, the median ridge is traced down about two-thirds of the back, but the sacral region and tail are more flattened. In the specimen numbered 3, it similarly extends down the median line of the back. And in number 4 the ridge is indicated apparently in the tail, where there appears to be evidence of a median longitudinal division beneath the angle of the ridge, owing to the existence of some more durable substance in that position. The fragmentary remains also give some evidence of this median longitudinal structure. Such an angle along the neck and back would be expected in the body of a Plesiosaur.

The head in the specimen numbered 1 is bent at an angle to the neck in a way which is commonly seen in the embryos of reptiles.

On the middle of the side of the head there was present when the specimen was found a scale with a radiated structure, which had the appearance of being a sclerotic circle of bones about the eye, which, although unknown in Plesiosaurs, is a character of some fossil reptiles, like *Rhopalodon*. The neck contracts behind the head, and then steadily widens along its length down to the position in which the fore limbs are given off. The neck does not appear to increase in depth so rapidly as in width, as though cervical ribs were well developed. It is nearly straight in the specimen (No. 1), but makes a small angular bend with the back, a character which is somewhat obscured by abrasion which the back has undergone.

Limbs are given off where the body widens transversely behind the neck, but in this specimen (1) the fore limb is only partially exposed on the left side, so as to show its edge. It appears to be narrow, but is evidently small and short, like a limb imperfectly developed.

In the same way the hind limb, which is imperfectly preserved on the left side, appears to be shown laterally. The neck of another individual is seen passing under the middle of the abdomen of this specimen, and this apparently causes

a ridge on the external side of the skin of the animal, as though the neural spines already existed in the neck, and sharply elevated the soft tissues of the animal which covered them.

In the specimen No. 2 the forelimbs are also shown. On the right side they are short, flattened, lateral expansions, nearly as wide apparently as long, covered by two films super-imposed on each other. On the left side there is an obvious fracture, and what I suppose to be the limb seems to be nearly as deep as wide on its fractured surface, which is not mineralized with pyrites, but consists of clay. Behind the fracture the dorsal aspect of the limb appears to include a surface bone in the position of the ascending process of the plesiosaurian scapula.

In this specimen, which rests upon No. 4, there is no clear indication of hind limbs, and the tail as exposed is exceedingly short, being shorter than in the specimen No. 1. The specimen No. 3, which is smaller, has not apparently any indication of the budding of limbs except a slight convexity at the base of the neck on the left side; and in No. 4 the form of the body is distorted and cannot be regarded as giving conclusive proof of the existence of limbs.

Hence the evidence for the interpretation of the specimen as embryos of plesiosaurs consists in the present state of preservation of the fossil, in the form and proportions of specimen 1, which appears to indicate the head, neck, body, tail, and limbs of such a shape as a plesiosaur would show. Secondly, in the less perfect definition of the parts in the other specimens, which is such as might be expected in a group of embryos in various stages of development. Thirdly, in the community of character of the external structures, like the dorsal longitudinal ridge, seen in all the examples.

Further, there appear to be some faint indications of transverse segmentation like that of muscles, in the region of the neck in the specimen No. 1, and in the dorsal region in specimen No. 2.

The deficiencies of the evidence are the following :—The head in the specimen No. 1 terminates transversely in a truncated surface, rather like the nose in an Emydian Chelonian, instead of such a rounded nose as might have been expected. Secondly,

the pre-orbital region curves downward, and there does not appear to be any demonstrable indication of a mandible. An injury crosses the head from behind the right orbit forward, so as to break the continuity of the front of the head with its hinder part in such a way that, taken by itself, the identification of the head is not quite conclusive in the present state of preservation, notwithstanding some longitudinal markings like definition of the nasal and other skull bones. It is possible that the extremity of the snout is broken and lost, and that the lower jaw may be indicated in the film of clay, which is imperfectly preserved beneath the head, and that some small badly preserved white spots arranged in linear succession are indications of teeth. By the side of this head there is the anterior termination of another imperfect specimen which is possibly a head also. If so it terminates in a sharp point, compressed laterally and flattened above, and is manifestly much less developed; but I am unable to recognise indications of any parts of the head or its organs. The curvature of the head upon the neck is however similar in the two specimens.

These defects in the preservation of the specimens do not appear to me to be conclusive against the organic nature of these supposed embryonic Plesiosaurs; and I have stated them as fully as possible that there might be no acceptance of the interpretation which I have placed upon the specimen, without consideration of the grounds on which that interpretation may be questioned.

The following descriptions record the dimensions of the several specimens:—

I.

The extreme length of the specimen No. 1 measured along the middle line is 5 inches. The head measures $\frac{11}{20}$ of an inch, the neck is $1\frac{8}{10}$ of an inch long, the body is about $1\frac{6}{10}$ of an inch, and the tail as exposed is $\frac{6}{10}$ of an inch long.

The head appears to be long, narrow, contracting in front of the orbit, about a quarter of an inch deep posteriorly, and half that depth at the anterior termination of the snout. The two sides of the head are inclined to each other, and its summit is rounded much as in many plesiosaur skulls. Its lateral aspect is a good deal modified by the loss of the radiated circle

of sclerotic plates from the orbit. But the impression remains from which the circle came away, and although delicate, it appears to show some evidence of a radiating structure. The pit which has held it is not now circular, but deeper than wide. The eye was rather behind the middle length of the head, was relatively large, extending between the crown of the head and the inferior angle of the palate. There appears to be some matrix in the middle of this depression. At some distance in front of the orbit on the side of the head, in the position occupied by the right anterior nostril of a plesiosaur, is a circular area very slightly raised, with a small central spot, which I regard as being situate as the nostril would have been in the living animal. Extending between the nostrils towards the orbit, there are parallel longitudinal ridges such as might margin two slender nasal bones, and these surfaces appear to be truncated posteriorly in a line with the middle of the orbit, as though the frontal bones there joined the nasal bones. There is some appearance of the parietal foramen, though in the present state of preservation it is not possible to identify it. The side of the head has a nearly straight palatal margin behind the orbit, and as this is inclined a little outward and downward, it gives the head the appearance of being deeper as well as wider than the neck behind it.

The neck is a quarter of an inch wide at its inferior border behind the head, but it is not more than $\frac{2}{10}$ ths of an inch deep. Its two sides are inclined to each other, and convex, meeting superiorly in the median ridge already described, which is sharper in the front of the neck than where the neck joins the body. The neck is convex on the sides, and on the left side, on which the preservation is better, there appears to be a lateral angle such as might result from the position of the cervical ribs. The width of the neck towards its junction with the transversely expanded body is $\frac{1}{2}$ an inch, but its depth appears to be somewhat less. The external surface is smooth. There are many transverse delicate lines upon its surface. The neck is nearly straight, showing a slight convexity at its lower third such as in a plesiosaur might result from a group of neural spines in that position being slightly elongated.

The transverse expansion at the base of the neck is most marked on the left side in which the preservation is most distinct, and is such as would correspond with the width of the bones of the shoulder girdle and the attachment of the limbs.

The body in its relative shortness as compared with the neck, in the convexity of its sides, and in transverse breadth, has such proportions as might be anticipated in a young plesiosaur. It measures rather less than an inch where widest in the middle, and $\frac{3}{4}$ of an inch in front of the hind limbs. The preservation of the external surface is unfortunately somewhat imperfect.

The limbs are imperfectly displayed, those on the left side are most distinct. Both the hind limbs appear to be indicated, but the form is not shown, and is so different from that indicated in another specimen, as to suggest the idea that their lateral edges only are seen. The measurement between the limbs on the left side is about $\frac{17}{30}$ ths of an inch. The form of the body appears to be depressed as though it were not more than half as deep as wide.

Behind the hind limbs the body curves downward rapidly and rapidly contracts from side to side, terminating in a tail which is not more than $\frac{8}{10}$ ths of an inch long, and is therefore shorter in proportion than the tail in an adult plesiosaur.

There is a manifest angular ridge in the median line upon the tail, although its external surface is lost. The form of the tail as exposed is a triangle, which is longer than wide, with its lateral contours continuous with those of the sides of the body behind the hind limbs.

II.

The specimen numbered 2 is apparently somewhat larger than the example just described, and appears to measure 6 inches in length. This is the individual over the neck of which, the specimen numbered 1 appears to extend, so that the neck of No. 2 passes under the middle of the abdomen of No. 1, and extends on its opposite side. It must however be stated that there is no definition of the head in this individual; and that the anterior part of the neck does not so manifestly pass continuously under the body, though this may result from the way in which that side of the specimen has suffered.

from surface abrasion. Measured in length, the neck is about $2\frac{1}{10}$ ths of an inch long, and the body and tail are together about $\frac{2}{10}$ ths of an inch longer.

As preserved they extend in a semi-ovate curve, which embraces more than half the circumference of the concretion. The neck appears to be proportionately about as long as in the specimen No. 1, but its base does not seem to be so wide, nor is there any sharp definition of its substance from the body of the individual which is supposed to overlap it. This however might be due to conditions of preservation; and the curvature between the neck and the limb at the shoulder on the left side, is a similar concavity. As already remarked the median longitudinal ridge is manifest down the back, which is convex in length, and convex from side to side. Its inferior lateral margin is rounded as in the specimen No. 1, and the under surface appears to be similarly flattened, so that the depth of the body is not more than $\frac{13}{20}$ ths in its wide hinder part, where the width is $\frac{19}{20}$ ths of an inch. The tail is similarly short, a median ridge extends down it like that on the back, it has a triangular form, and terminates in a point. It is bent towards the right side, and the body of the specimen rests upon and partly covers the left side of the body of the specimen No. 4. The hinder limb on that side is not seen; and on the right side it appears to be imperfectly developed, or broken away, although there is a distinct lateral prominence at the side of the tail, which may indicate the budding base of the limb. It is not so distinct as in the specimen No. 1, appears to be somewhat further backward, and rather smaller. The fore limbs are at the sides where the neck joins the body. That on the left side is imperfect at its extremity, but is extended outward and a little downward, and as preserved is about $\frac{1}{2}$ inch long, as wide at the base, flattened above, and somewhat rounded. It appears to consist of a clayey material. The other limb on the opposite side is similarly extended. It also consists of hardened clay in the centre, of which there are some indications by means of difference of colour of two connected bodies, with corrugated outlines. The depth of this limb is greater, but its width is much less than that of its fellow on the opposite side. A concave curve of distinctly defined skin-

like surface connects it with the lateral contour of the body. Compared with the fore-limbs of the specimen No. 1, the differences are greater than would have been anticipated, but they may result from the different aspect which the limb has when exposed horizontally, as compared with the depressed condition at the side of the body in the specimen No. 1.

III.

The third example is the smallest and most unsatisfactory. The head is not seen, and the greater part of the neck is hidden under the specimen No. 1, and only about $\frac{1}{4}$ inch of a neck remarkable for its singular compression is exposed. The body has the usual antero-posterior curvature; the tail being bent downward rather more sharply than in the examples described; and although the specimen has been fractured in this region, the tail appears to be relatively smaller and shorter than in the other specimens. The body is convex from side to side, with a characteristic median dorsal ridge, and increases in width from the neck to about the sacral region. At the base of the neck there is a slight transverse expansion on the left side. It is similar in kind to the right fore limb in the individual No. 2, but is relatively much smaller. There is no corresponding process on the opposite side, so that if this represents the budding of the fore limbs they are in a very rudimentary condition. Behind this lateral anterior expansion, the body contracts, and its transverse measurement does not greatly exceed $\frac{3}{10}$ ths of an inch. There is no clearly defined lateral border to the hinder part of the body, but as in the specimens described it appears to be nearly twice as wide as deep. There is no clear evidence of the hind limbs.

IV.

The fourth individual is remarkable for its distorted form. The head, if it exists, is buried in the matrix, and the neck is bent almost at a right angle to the body. It is partly overlapped on the left side by the individual numbered 2. The supposed neck is $1\frac{7}{10}$ ths inch long as exposed: and this appears to be equal to, or longer than the body and tail. The neck is exceedingly narrow in front, and widens transversely to about $\frac{6}{10}$ ths inch at the shoulder. The shoulder however has

manifestly no indication of a limb, but is convex as though the limb were budding. There is no recognisable trace of a hind limb. The body has the usual width relative to depth, and the usual angle in the median line of the neck, but it cannot be traced over the distorted form of the body.

These are the more important details of aspect of this remarkable specimen. At present I am unaware of any evidence concerning the mode of reproduction of any plesiosaurs, other than the inference which such specimens suggests that some species were viviparous. It were to be desired that the specimen gave more conclusive demonstration of its organic nature; but the characters described have seemed to me to be of sufficient interest to be put on record, and they may draw attention to possibilities of further evidence being found by examining adult specimens.

“THE NINE-WEEKS’ FROST,”

(*Read March 5th, 1895.*)

The past Winter, if, indeed, the adjective has yet been earned, will impress itself on our memories along with those of 1855, 1860, and 1878-9. It resembles the first in the period of chief cold, and the last in its prolonged severity. That of 1860 was noteworthy from a shorter spell of extreme weather, the thermometer reaching our lowest record of 4° below zero on Christmas Eve.

This season’s frosts began on December 27th. Since then until now no meteorological day has passed without at least a frost on the ground, except January 17th, 18th, and 20th. Skating has been possible unbrokenly from the beginning of the year.

The cold was more striking from the preceding openness. November was abnormally mild, the mean temperature here being 7° (and December 1°) above the average from 1841-1890, the fifty years taken throughout these notes for comparisons. As a consequence of this the number of flowers in my garden still lingering in bloom was 41 and 28 respectively, against 36 and 15 in 1893, and 26 and 20 in 1892.

In the South the contrast was even greater. At Street, near Glastonbury, Somerset, I observed during the Christmas vacation 98 wild flowers, and 113 garden, or a joint total, allowing for duplicates, of 204. The nearest approach to this, since records were begun in 1877, was 183 in 1881-2. In 1878-79 only 32 were noted, and 31 the next year; whilst 1890-91 gave but 10, the ground being snow-bound the whole of the 2½ weeks. Among the wild flowers seen in the present winter 56 were autumn stragglers, 16 all-season flowerers, and 26 spring-blooming. The former included a field of ox-eye daisies, gay enough to give a handsome bunch; blackberry, the three buttercups, corn gromwell, erigeron, and the large scabious. Primroses were in profusion in a wood with southern slope, near which, on Christmas Day, a party of us lay basking in the sunshine as if it were summer; dog mercury was over a foot high; willow-catkins were in large bud; on Dec. 29th the 3-fingered saxifrage was picked; and a root of *Draba verna*,

with sixteen flower-heads, five of which were fully out, a sixth entirely gone to seed. But the spring flowers were less common than sometimes: snowdrops did not appear until Jan. 4th, yellow aconite on the 16th, after my departure, and crocuses on the 24th. In 1881-2, these flowered by Jan. 1st and Dec. 16th, respectively, the snowdrop by the 28th. Of wild flowers, 31 out of 88 were spring growths. The difference was due to milder December weather in 1881, and its continuance into January. Where, as then, no recent winter was so mild as this up to Christmas, no winter, not even that of 1855, has been so continuously severe since.

The thermometer did not sink below 20° until Jan. 10th, and the next three days, touching 11° on the 11th. The Ouse bore on Saturday and Sunday, the 12th and 13th. After the partial thaw of the next week, it again went below 20° from the 28th to the 31st, and from February 6th to 14th. This last period gave no less than four days below 10° , namely, $2\cdot70$ on the 8th, and $4\frac{1}{2}^{\circ}$, 6° , and 7° on the 9th, 10th, and 11th. At the close of the month there were frosts, although the screened thermometer did not fall to the freezing point. The *maxima* were never exceedingly low, falling below 32° twice in January, and seven times in February (26 on the 7th).

Snow fell heavily more than once in January, but February had remarkably little, the total amounting to 0·33in. of "rain," a fall exceeding only the almost rainless February in 1891, and the fall of 0·28 inches in 1846. Yet, at least a few flakes fell on 14 days, and on 21 days in January. These, with four more already this month, total up within one of the entire number for 1893 and 1894 combined. As a consequence, the unusually fine skating on the Ouse remained unspoiled. No one could have wished for grander ice than was afforded in some reaches, especially the $3\frac{1}{4}$ miles from Linton Locks up to Aldwark Bridge. Skating was possible, with a few slight breaks, up to Ripon. The river bore on the 9th, and was still safe in places till the 20th, the ice at last disappearing on the 27th. But when barges finally broke up the ice on the Foss opposite the gas-works on March 1st, it was still six inches thick; and, the same being true of ponds, they continue to afford safe, if not capital, skating.

The ground was, and remains, frozen to a depth of $1\frac{1}{2}$ to 2 feet; consequently water-mains were reached in some cases, adding seriously to the difficulties of frozen pipes above ground. Stand-pipes are still in constant demand. The present has, probably, been the most serious visitation of the kind, both for the water company and the public. An extra million gallons a day entirely failed to prevent the shortage of water, so many taps were kept flowing to avoid freezing.

Although low in January, the barometer was decidedly high in February. Early in January a "high" area established itself over Finland, European Siberia, and the north Ourals. It stood at 30·7 (Archangel) on Jan. 13th, but disappeared on the 17th: a high area then formed off our islands, so as to bring back cold, northerly winds, when 2° below zero was reached (Jan. 28th) at Llandoverly. That day another high pressure area began to develop over W. Russia, and the two joining gave readings over 31 inches—a most unusual event—over South Scandinavia. This moved slowly northwards, and again reached 30·9 from February 5th to 7th. Still keeping very high through the succeeding, coldest, period, it fell at last below 30 inches on the 11th, rising again on the 13th, and continuing high over our islands; but as it was now lower to the north-east, the air no longer swept down so directly upon us from arctic regions, and the cold relaxed. The extreme cold in our islands began on the day of the highest readings with 20° at Llandoverly. Temperatures below zero were officially recorded from six of our ten British regions, namely, W. & E. Scotland, N.E., S.W., and Midland England, and North Ireland. In N. Scotland 2° (above zero) was reached, E. England 1° , N.W. England 10° , S. England 2° , S. Ireland 6° ; whilst even the Channel Isles had 14° of frost. Bruemar ("E. Scotland") showed itself the coldest spot, its *minima* for the four successive weeks, from Jan. 27th on, being 1° , 9° , 17° , and 12° . Seventeen below zero is probably the lowest official record made in our islands.

The month was sunny, although no days were very clear. The night of the 8th, however, was exceedingly so, proving, in consequence, the coldest in nearly every part of Great Britain. At Ackworth, J. Neale, B.A., placed a thermometer on the

snow, on open, low ground. Zero in the screen was recorded, but here 17° below. The difference is great, but the conditions so exceptional that the observation is probably fairly correct. The West Riding hills were seen only once, but two or three days were almost cloudless. Ninety-nine hours of bright sunshine were recorded, which is nearly double the average, and exceeds the next sunniest, February 1887, by three hours. It will be of interest to compare the present year with previous records. There have been three colder months since 1840 at York, namely, the Crimean February, 1855 (22.1°), Dec. 1878, and January, 1881 (28.2°), but never a colder two months, though the following statement shows that if the two are averaged together the mean is a little lower in 1855:—

| | 1855. | 1895. |
|----------------------------------|------------------------|----------------|
| Mean of Max. and Min., Jan | 34.7° | 31.2° |
| „ „ February | 25.9° | 30.1° |
| „ „ Jan. and Feb. .. | 30.3° | 30.6° |
| Absolute Minimum, February, .. | $1\frac{1}{2}^{\circ}$ | 2.7° |
| „ Maximum, „ .. | 36° | 46° |
| Mean Minimum, „ .. | 20.7° | 23.8° |
| „ Maximum „ .. | 31.2° | 36.4° |

Thus February, 1855, had far lower maxima. Indeed, they were so high in 1895 that January was nearly as cold.

The next table shows all months which have had a mean temperature (maximum and minimum) at or below the freezing point:—

| January. | February. | December. |
|------------------------|------------------------|------------------------|
| 1842 .. 30.7° | 1853 .. 31.4° | 1846 .. 31.7° |
| | 1855 .. 25.9° | |
| 1867 .. 31.7° | | |
| 1871 .. 32° | | 1874 .. 31.3° |
| 1879 .. 31.7° | | 1878 .. 30° |
| 1881 .. 28.2° | | 1879 .. 30.8° |
| 1895 .. 31.2° | 1895 .. 30.1° | |

Or thirteen in all—Six in January, three in February, and four in December.

Next to 1855 and 1895, the coldest two months are thus seen to have been December, 1878, and January, 1879, 30.85° .

The next table gives all months in which the minimum temperature fell below 10° :—

| | |
|---------------------------|---------------------------|
| January, 1841 4° | December, 1879 0° |
| „ 1842 6° | January, 1881 1° |
| „ 1854 -3½° | March, 1883 8° |
| February, 1855 . . . 1½° | January, 1891 9·6° |
| December, 1856 6° | February, 1892 6·7° |
| „ 1859 6½° | January, 1893 7° |
| Christmas Eve, 1860.. -4° | February, 1895 2·7° |
| December, 1874 5° | |

Or fifteen in all--Six in January, three in February, one in March, and five in December.

These are but few, and occur in curious batches. Thus five come in seven years of the fifties (ending with 1860), and four in the last five years, leaving six for the other forty-three years. The coincidence by which all the December cases, and they alone, come from 1855 to 1879, is curious and suggestive. Any observer beginning in the former year would have had some excuse for asserting, after a quarter century's experience, that such cold snaps were confined to December.

Turning abroad, we find that, for Europe, 26° below zero was recorded at Archangel on February 5th, when the whole Continent was frost-bound except the extremities of the Mediterranean peninsulas. Deep snows along the Riviera, and orange and citron trees destroyed in Lombardy, were natural consequences. In Algeria, also, great damage to fruit and early vegetables was sustained, and the cold was far more widespread. We shall remember how it embittered the battles in China. B. B. Le Tall, Esq, writes that in Hobart, Tasmania, on January 29th, it was positively cold "turning in," although the date corresponds to our July.

But the experiences of the Eastern Hemisphere were mild compared with the Western, where, at the same time, the thermometer sank to or below zero over more than half the United States. Georgia, Alabama, and Mississippi were included, and even the very heart of Texas, in about the latitude of Alexandria. In New England, 26° below zero was touched. As in the Mediterranean, the tip of Florida escaped, and also the Californian coast up to Portland. In many of these regions even a frost is rare; hence the mischief to fruit crops is incalculable.

Further north, the previous months had also been excessively cold. A. W. Johnson, Esq., sent the minima for January from White Sand, Assiniboia, in the latitude of London. Three days they were above zero, actually struggling to 14° on the warmest day. The average was 16° below zero; and 40° below, when mercury is as solid as lead, was reached on the 8th.

J. EDMUND CLARK,

NOTE.—The following cutting from the *Yorkshire Herald* of March 4th, of a meeting held on the 2nd, is noteworthy:—

RICHMOND DISTRICT HIGHWAY BOARD.—£400 SPENT IN SNOW CUTTING.—* * * * *

* * * * * The estimate for the ensuing month was £419 10s., and of the large estimate on the previous month about £400 was chiefly spent in snow-cutting, and with a balance in hand of £187 9s. 6d., a cheque was given for £232 0s. 6d. Such a snowstorm had not been known for many a year. The western mountain roads were still blocked, and the cost of cutting would exceed the value of the material conveyed to and from Swaledale. In order to reach Wensleydale a detour had to be made from Reeth and district round by Brompton and Bellerby. Mr. John Barker said he stopped the cutting. When it was effected the roads were overblown, and the men could not stand out in the drifting snow.

Read

12/15/03



